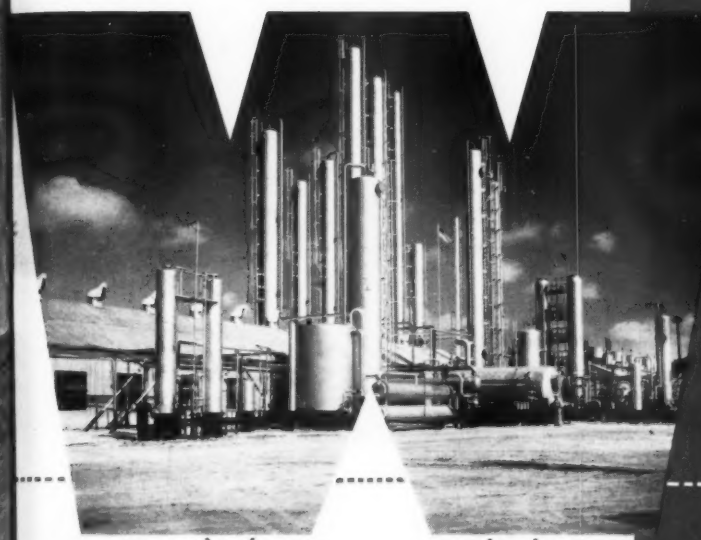
the OIL AND GAS JOURNAL

PERIODICAL
SEP 29 1950
DETROIT



WARREN'S

Stabilized

THE PERFECT

NATURAL

FOR YOUR

GASOLINE

NEEDS

Whether you're compounding a prescription or manufacturing a product, it can be no better than the ingredients you use. And to build the best in modern motor fuels, you should use Warren's Stabilized Natural Gasoline. Warren's Stabilized Natural contains fine lead susceptibility and guarantees speed, power and performance. Its Low Front End, High Octane and Greater Volatility — its Quick-Starting, Carbon Free, Anti-Knock properties insure a Uniform Quality that has enabled refiners to meet the demands of today's modern, high speed traffic and industrial conditions.

NATURAL GASOLINE
Butane
Propane
Iso-Butane
Iso-Pentane
Hexane
Heptane
STA-VOL-ENE

WARREN PETROLEUM CORPORATION

Producers, Manufacturers, Exporters and Marketers

Export Terminals: Corpus Christi, Port Arthur, Baytown, Texas City, and Norsworthy, Houston, Texas.

TULSA 2, OKLAHOMA CABLE ADDRESSES: Stavolene, Warren

Crude Oil, Natural Gasoline and Liquefied Petroleum Products

PRICE 50 CENTS TABLE OF CONTENTS PAGE 43 **SEPTEMBER 28 1950**

XUM

powerful good service

LANE WELLS

TECHNICAL OILFIELD SERVICES

LOS ANGELES • HOUSTON • OKLAHOMA CITY

General Offices, Export Office and Plant • 5610 SO. SOTO STREET, LOS ANGELES 58, CALIFORNIA

LANE-WELLS CANADIAN CO. IN CANADA • PETRO-TECH SERVICE CO. IN VENEZUELA

AG-308

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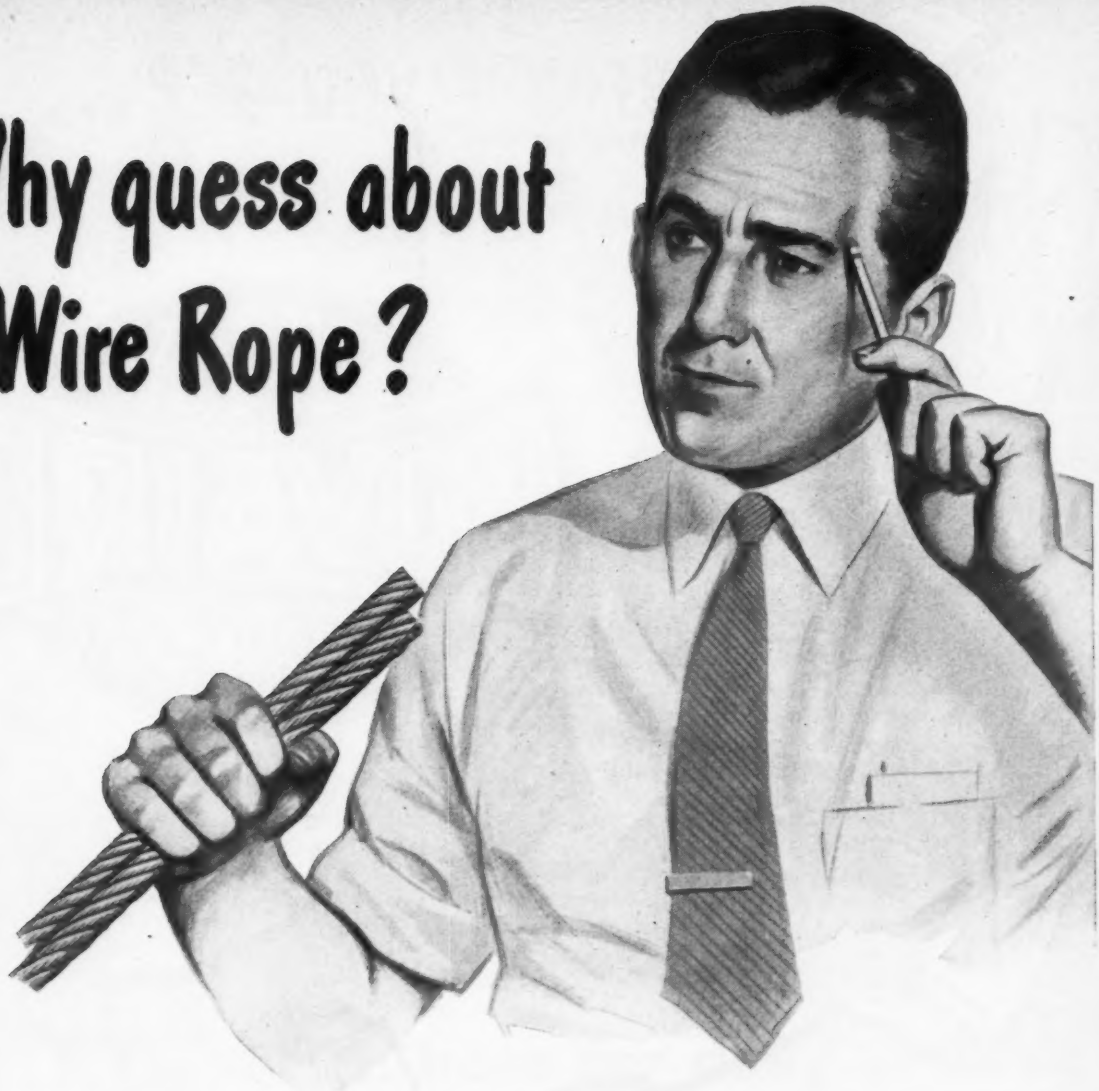
Why guess about Wire Rope?



Let's call this a picture of a man who used to guess about his wire rope. He often guessed wrong. Was never really sure which brand was costing him the most—and the least.

Now he's keeping records. A Bethlehem man showed him the value of knowing what he was actually getting for his rope dollar. Showed him that the true cost of wire rope is the cost per unit of work—per ton-mile, cubic yard of rock moved, etc. Showed him how easily records could help him determine this cost per unit of work.

It's something Bethlehem strongly recommends, for purchase price alone is a false yardstick of rope value and rope economy. Frankly, we welcome any steps that will help users compare brands of rope, for the Bethlehem product is built to give outstanding service at very low cost. This is a fact you can prove to your own satisfaction by keeping a few simple records.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

LET YOUR RECORDS TELL YOU!

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910 at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1950.

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Bovaird stores are strategically located throughout Illinois, Kansas, Oklahoma and Texas to give you complete, dependable, one-stop service for all your supply needs.

You'll find each Bovaird store well stocked with nationally known brands and manned by personnel capable of helping you select the right supplies for your operations.

OFFICES AND STORES

ILLINOIS—Clay City, Grayville, Salem

KANSAS—Chase, Great Bend, McPherson, Pratt, Russell, Wichita

OKLAHOMA—Duncan, Oklahoma City, Pauls Valley, Ringwood, Sapulpa, Seminole, Tulsa

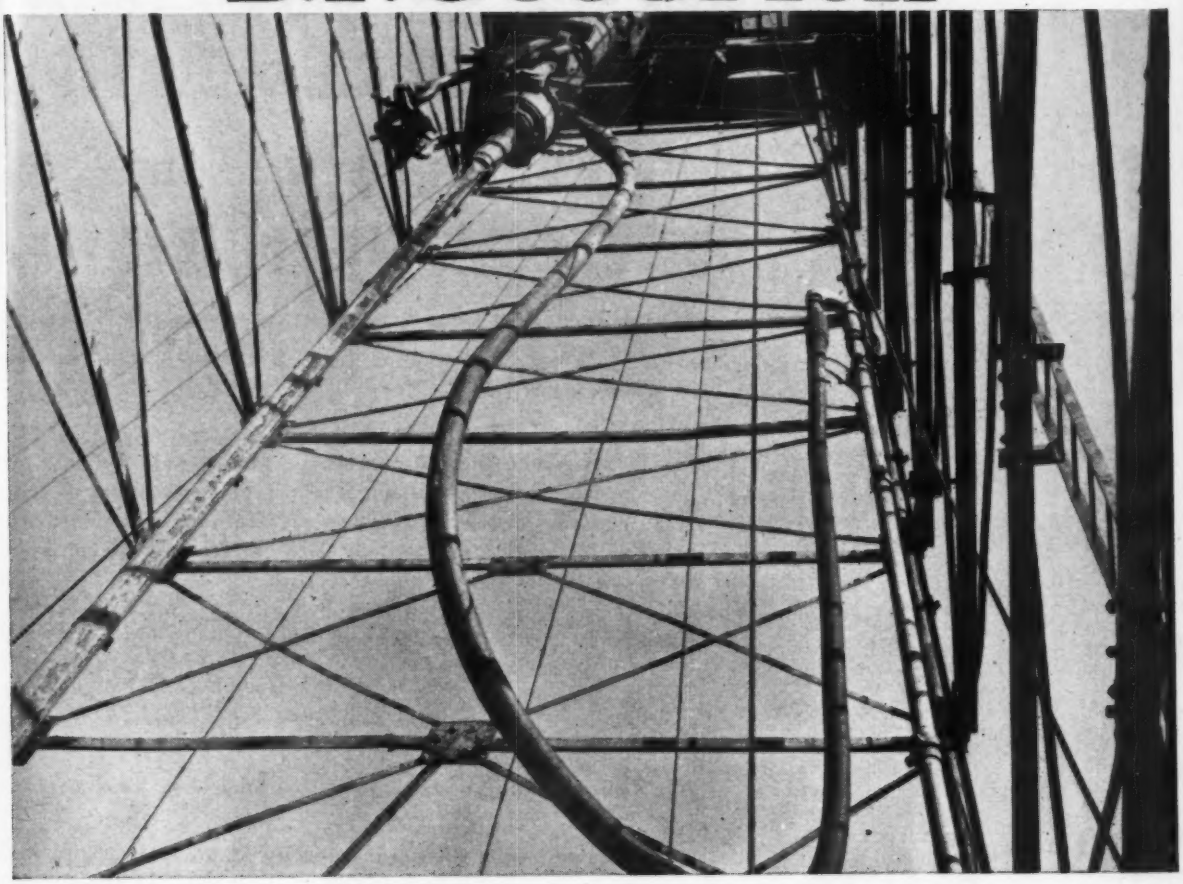
TEXAS—Borger, Dallas, Midland, Odessa, Pampa, Snyder

"Buy From Bovaird"

THE Bovaird SUPPLY CO.

GENERAL OFFICES
TULSA, OKLAHOMA

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



B. F. Goodrich hose for deep drilling more flexible, stronger inside and out

Highflex rotary drilling hose with cable wire construction

WHEN handling is rough, pressures high, this hose has strength to spare. It's B. F. Goodrich Highflex rotary drilling hose. Armored against rough treatment, resistant to burst, sun-checking, weathering.

Cabled wire reinforcement—Two spiral-wrapped plies of high tensile cable wire, plus eight plies of square woven hose fabric give Highflex extra strength for extreme bottom hole pressures. Ends are reinforced with additional plies of wire and fabric to protect against bending stress at coupling. Most flexible hose for deep drilling. Flexes back from shocks and impacts.

Permalock coupling—This B. F. Goodrich coupling will not move out of position under highest drilling hose pressures. Hose ends are enlarged to accommodate a Permalock coupling with the same inside diameter as the hose, assuring full-flow. Made of cast steel. Lighter, more compact than built-in or clamp-type couplings. Guaranteed to be leakproof. Now available on Highflex and other B. F. Goodrich rotary hose and vibrator hose.

Cover resists abrasion—Thick, tough cover developed by B. F. Goodrich to resist gouges, scrapes, tears, cuts. Let it stand out in sun, wind, rain without harm.

Easy to handle—No dead weight to drag when Highflex hose is moved on or off the job. Spiral-wrapped cable is flexible, easy to coil. Hangs well from standpipe.

Oilproof tube—Oil in the mud will not cause swelling or rotting of tube. 5/32" thick. Resists abrasion.

B. F. Goodrich Highflex rotary drilling hose with cable wire construction and Permalock couplings is now available in all important oil drilling areas. Qualifies for Circle C, American Petroleum Institute. Ask your supply store. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Oil Field Products BY
B.F.Goodrich
RUBBER FOR INDUSTRY

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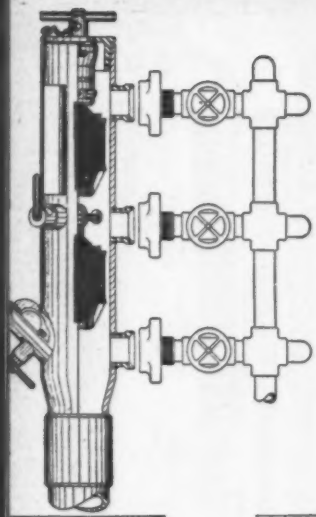
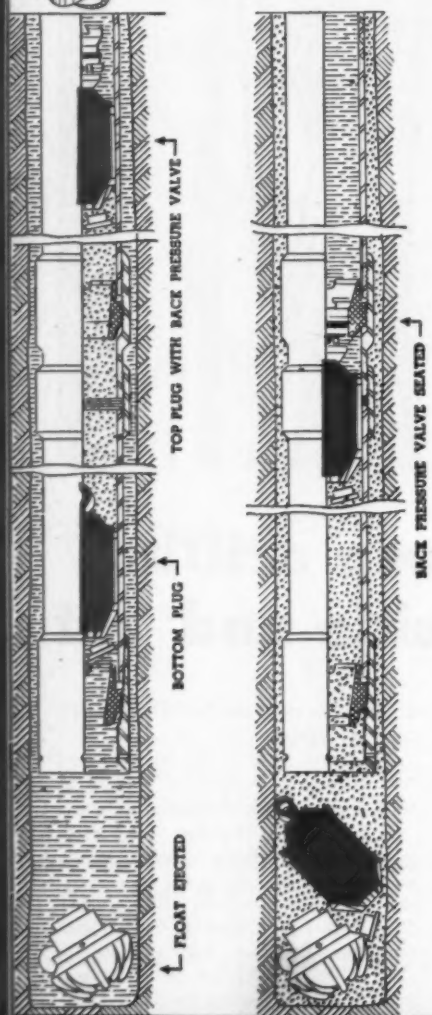


There's *only one* way to be sure of a MASTER CEMENTING Job . . . that's with the RECTOR "FULBORE" CEMENTING METHOD



A Master Cementing job puts the specific volume of uncontaminated cement behind the casing . . . sets up a secure, leak-proof bond between casing and open hole . . . reduces amount of cement left in casing and bottom of hole to a minimum. It is one that can be done efficiently and quickly, without trouble and practically no downtime from beginning to end of operations.

Rector Fulbore Cementing is the *only* method that can give you this kind of a job.

1. The two plug method separates cement column from mud fluid . . . delivers uncontaminated cement at casing shoe.
2. Uniform body of cement at shoe and shoe joint minimizes hazard of channelling.
3. Greater casing discharge capacity at lower pressure is obtained by ejecting float assembly from shoe before cementing.
4. Positive back pressure valve prevents back flow of cement when seated in stall collar.
5. Plug retainer type cement head provides closed circuit that prevents air entrainment in cement column. Trip ball, two plugs and back pressure valve released from head with practically no downtime.
6. Cement placement in annulus back of casing accomplished in minimum time.

Ask your Rector Representative or Supply Man for facts and details about a Master Cementing Job with THE RECTOR FULBORE CEMENTING METHOD, or write for bulletins.

RECTOR WELL EQUIPMENT CO., INC.
FORT WORTH, TEXAS
Ft. Worth Plant: 1100 N. Commerce St. Houston Plant: 2215 Commerce St.
REPRESENTATIVES IN ALL ACTIVE FIELDS.

RECTOR FULBORE CEMENTING METHOD

ASK YOUR SUPPLY STORE FOR RECTOR "FULBORE" CEMENTING EQUIPMENT

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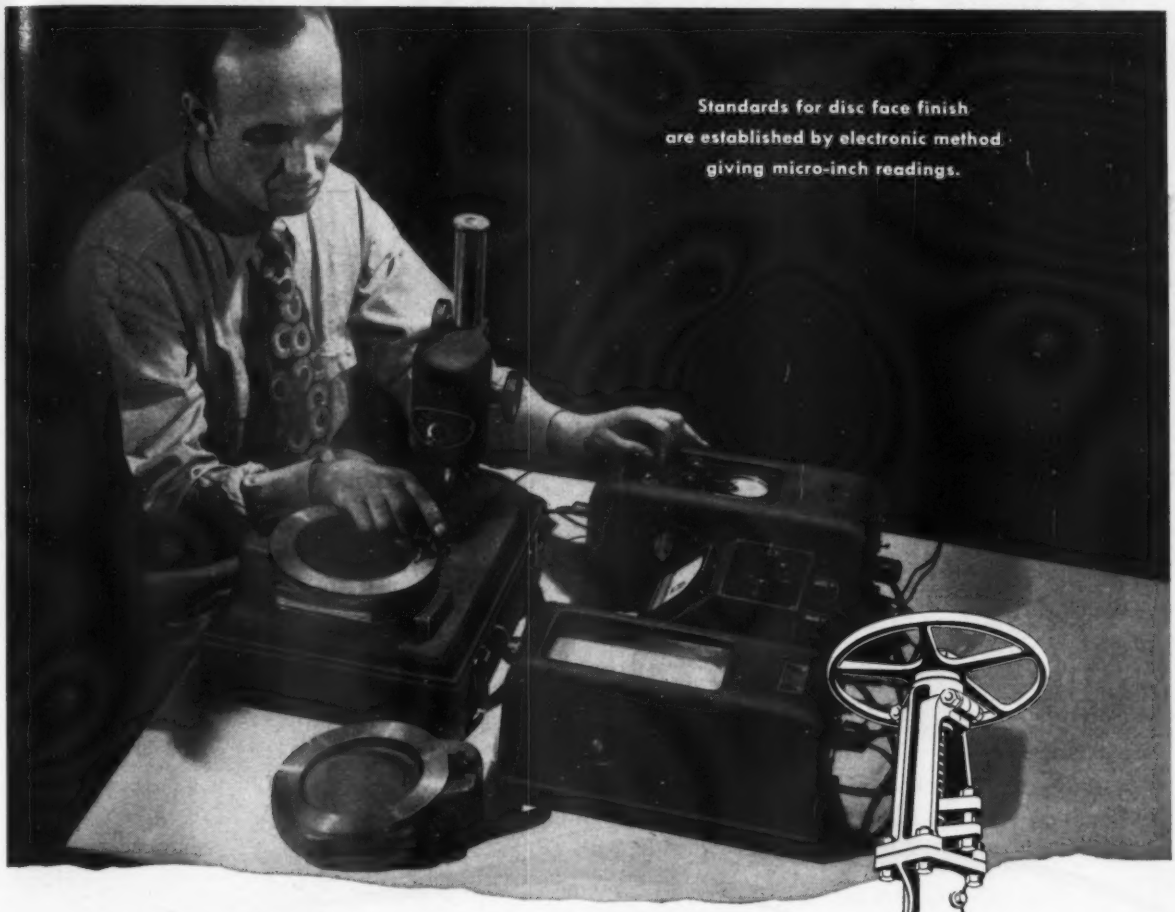
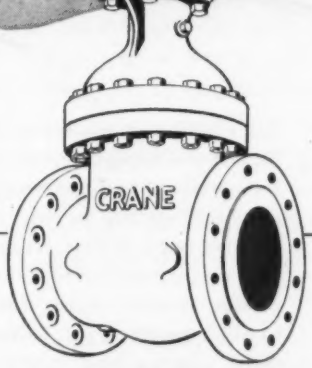
More **CRANE VALVES** are used than any other make



How CRANE controls quality to the Micro-Inch to cut your valve costs

Surface finish of a valve's working parts has a lot to do with its wear resistance and operating efficiency. A correct finish means a tighter-seating valve, easier operation, greater ease of maintenance. In Crane Quality valves, the surface finish of machined parts is measured and controlled to rigid limits. The standards for quality control of surface finish are determined by the most scientific methods as shown above. Yes, nothing is overlooked to make Crane Valves the lowest-cost valves in the long run. *That's Crane Quality!*



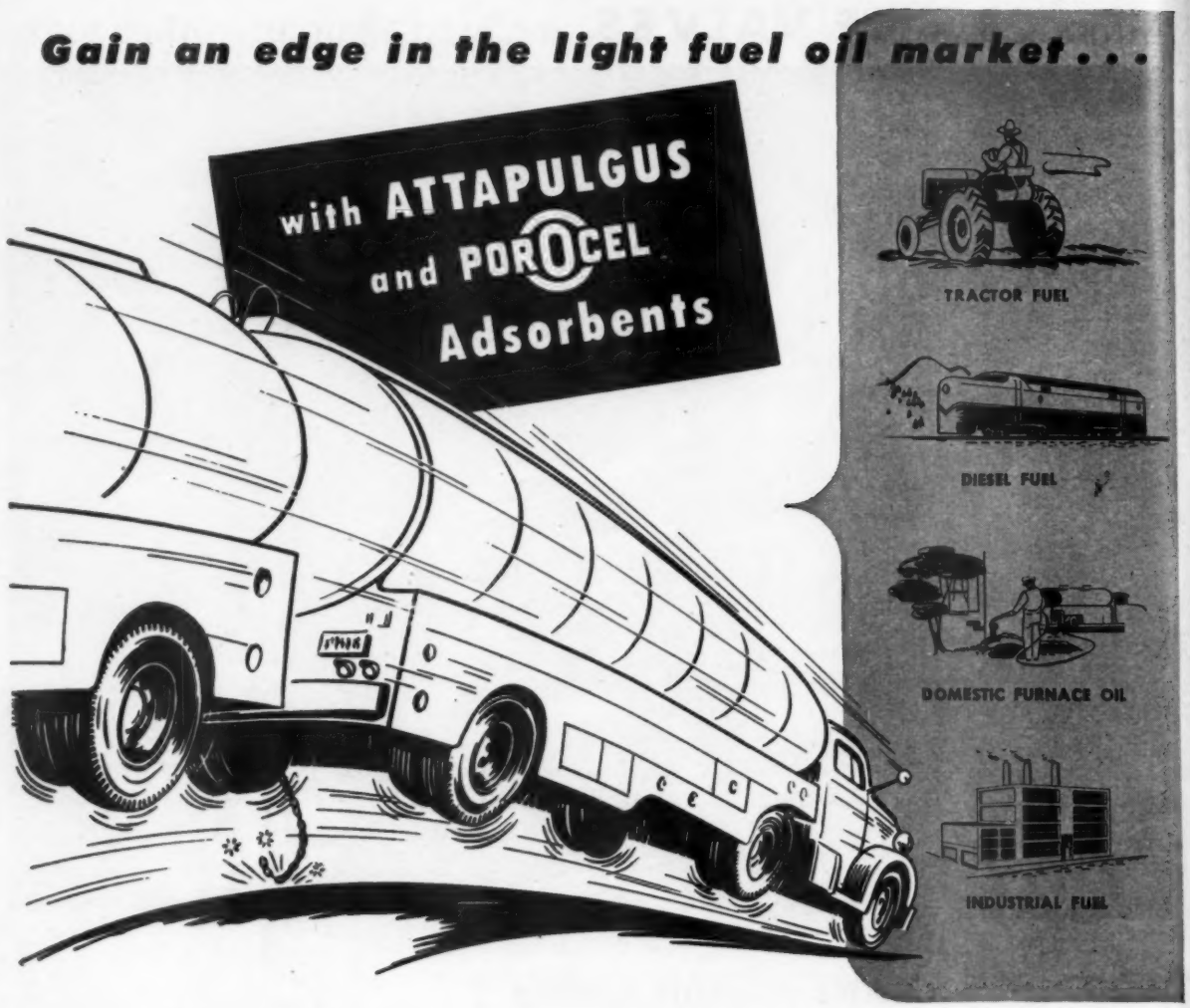
Precise quality control of materials, design, and manufacturing—to the highest degree in the industry—makes Crane valves the lowest cost valves in the long run. On steam service, oil and oil vapor lines, for example, you'll find Crane Steel Gate Valves a sure remedy for high maintenance costs. Talk it over with your Crane Representative.

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

Gain an edge in the light fuel oil market . . .



In a highly competitive market for distillate fuel oils—Diesel, domestic furnace, tractor, industrial—the refiner who places emphasis on high quality in his products has a decided edge. In fact, selling strategy often is based on points of superiority that assume smaller stature at other times. This applies to other products too—absorption, enrichment, smudge, and insecticide spray oils.

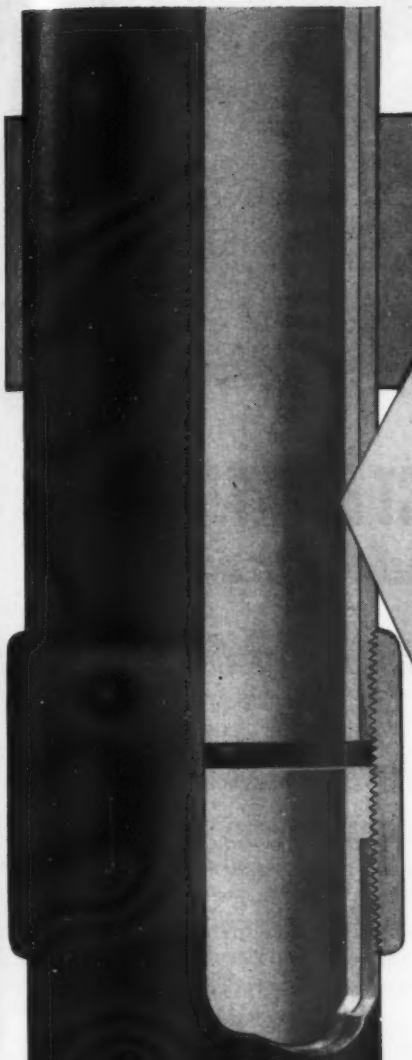
A final straining step using Attapulgus Fullers Earth or Porocel Activated Bauxite is an economically attractive form of light fuel oil quality insurance. These adsorbents are recognized standards for the selective "polishing" of light distillates at low cost. Oils in this range can be filtered to high yields for removal of moisture and sediment. Removal of residual amounts of treating chemicals is accomplished. Moisture haze is removed; color improved or stabilized.

Attapulgus and Porocel adsorbents couple low price with long service life—an unbeatable combination when finishing distillates whose market price generally dictates a minimum of refining expense. Process equipment required is relatively simple and inexpensive —often built from on-site components.

Let's explore the possibilities of improving your position—hence profits—in the light fuel oil market. Our staff is at your service to help select the right adsorbent and the right conditions.

ATTAPULGUS CLAY COMPANY *Fullers Earth* · **POROCEL** CORPORATION *Activated Bauxites*

Dept. V, 210 West Washington Square, Philadelphia 5, Pa.



STOP Costly Corrosion with J&L Cement Lined Steel Pipe

- Handles all mildly corrosive liquids economically.
- Unaffected by atmospheric temperature changes.
- Withstands high working pressures.
- Easy to install—no special tools or fitters required.
- Available through any of our 105 conveniently located Sales Points.

Here is the pipe to handle mildly corrosive liquids economically. J&L Cement Lined steel pipe costs little more than regular pipe and a lot less than glass, non-ferrous or special alloy pipe. The increase in cost over ordinary pipe is more than made up by longer life, reduced maintenance, and greater safety.

Installation of J&L Cement Lined steel pipe can be handled by your regular crews. No special tools are required. A complete line of nipples, fittings and couplings — all lined with the same exclusive J&L Cement — are available. The pipe can be dismantled and reassembled.

If you are troubled by the high cost of piping salt water, diluted acid or other corrosive liquids, see your nearest Jones & Laughlin Supply store. It will take just a moment for you to see how J&L Cement Lined steel pipe can stop costly corrosion.

Member Petroleum Equipment Suppliers Association

80 Stores
17 District Sales Offices
8 Resident Salesmen

"... here's MY warehouse!"

Jones & Laughlin Supply Company

Subsidiary of Jones & Laughlin Steel Corporation
TULSA, OKLAHOMA

J&L STEEL

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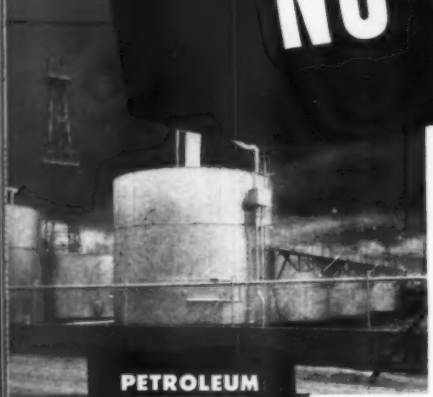
CORROSION PLAYS NO FAVORITES

CHEMICAL INDUSTRIES



PETROLEUM INDUSTRY

You must PROTECT or PAY
...you have no other choice

No business escapes the effects of corrosion. It costs industry over $6,000,000,000.00 annually. Yet much of this costly damage might be avoided by taking just two simple steps—

1. Check the danger points in your plant—manufacturing equipment, piping, valves, tanks, motors, and all similar items.
2. Protect them with Amercoat—the corrosion-resistant coatings; each designed to meet specific conditions.

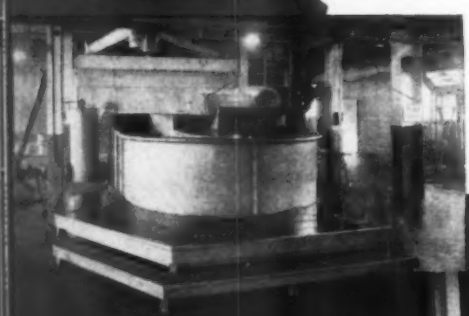
Most conventional coatings fail when corrosion threatens, because they are neither designed nor suited for severe service. Don't risk needless loss—protect now with Amercoat.

MEAT PACKING

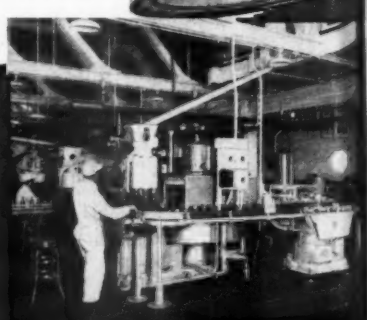
AMERCOAT CORPORATION

A Division of
American Pipe and Construction Co.
4809 Firestone Blvd., South Gate, California

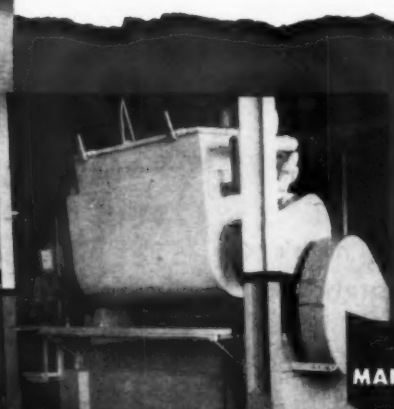
FOLLOW THE LINE OF *most* RESISTANCE



PAPER MILLS



BEVERAGE PLANTS



RAYON MANUFACTURING

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Before you buy

a diesel engine

...be sure and read this booklet!

A sound basis of comparison is essential to the selection of the proper diesel engine to meet your power requirements. And that's just what the booklet *"10 Questions to Ask a Diesel Engine Salesman"* gives you. If you want economy, dependability and long engine life this booklet will show you what to look for in a diesel engine.

In addition, the *"10 Questions"* booklet describes fully the Murphy Diesel line of heavy duty "true" diesel engines, giving design details and basic specifications. No diesel power user or prospective diesel power user should be without this helpful 28-page booklet. Write for your copy, mentioning your company affiliation and position.

MURPHY DIESEL COMPANY

5305 W. Burnham St., Milwaukee 14, Wisconsin

OIL INDUSTRY FACTORY BRANCH — Sales, Parts and Service:
113-117 S. Elwood St., Tulsa, Oklahoma
Dealers in principal oil industry centers

Heavy duty power
for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipe line pumping, 90 to 220 H.P. Generator Sets 60 to 133 K.W.

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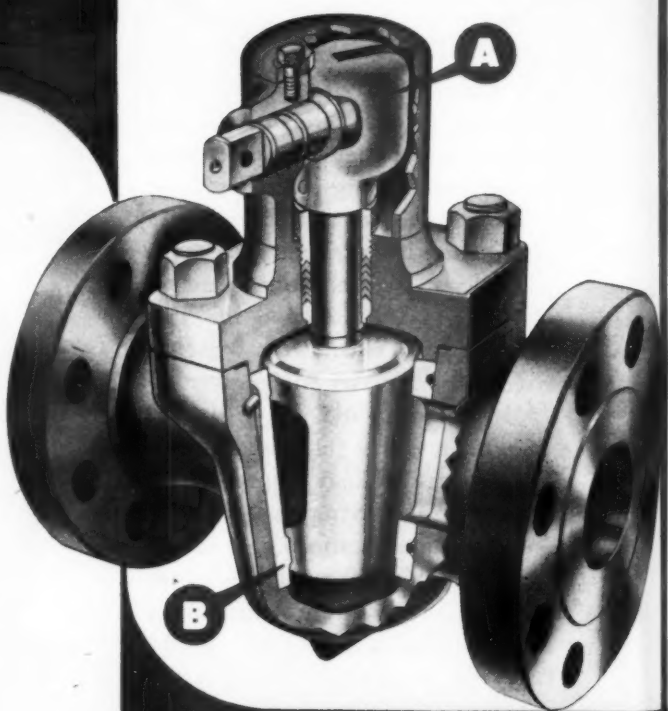
HF
ALKYLATE
H_2SO_4

the ACID TEST for any valve, is a cinch for

Cameron
NON-LUBRICATED
LIFT-PLUG VALVES



THE BEST FEATURES OF PLUG AND GATE VALVES COMBINED WITH NEW CAMERON INNOVATIONS

NON-LUBRICATED—no grease of any kind required to effect a seal; prevents contamination of line products; reduces chance for human error and need for maintenance.

PRESSURE SEALING—when plug is seated, line pressure automatically forces seat into tighter engagement with plug—body distortions do not affect the seal.

UNIQUE LIFT-PLUG ACTUATOR—a novel mechanical design which lifts, turns and reseats plug in continuous turn of a lever.

RENEWABLE SEAT AND PLUG—easily replaced; permits any desired trim for specific services.

REPAIRS ON THE JOB—can be completely overhauled without removal from line; no special tools or skill required.

EASY OPERATION—requires less operating effort than other valve designs.

FORGED STEEL—all parts, including body, for most sizes are press or drop forged from specification materials.

Your inquiries are invited, and complete details on the unique mechanical design of the Cameron Non-Lubricated Lift-Plug Valve will be gladly sent on request.

CAMERON IRON WORKS, INC.
P. O. BOX 1212 • HOUSTON, TEXAS
EXPORT: 74 TRINITY PLACE, NEW YORK, N. Y.

A—LIFT-PLUG ACTUATOR lifts, turns and reseats plug in only three-quarters of a turn of the operating wrench.

B—SEPARATE, RENEWABLE SEAT: Pressure created body deflections and line strain cannot destroy the geometry of the fit between sealing surfaces because they cannot be transmitted to the separate seat. In fact, line pressure improves rather than destroys the seal.

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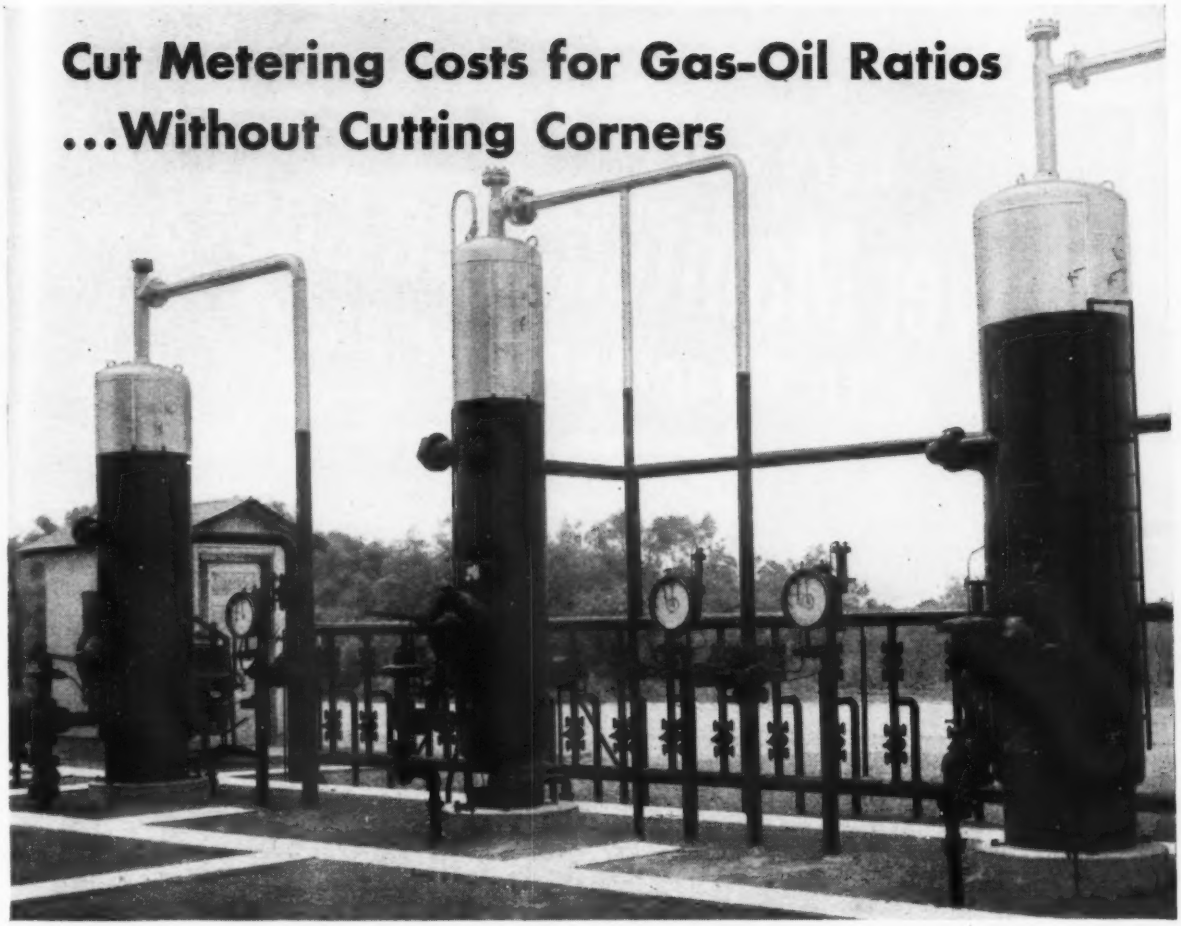
Cut Metering Costs for Gas-Oil Ratios ...Without Cutting Corners



Measuring gas from Separator Batteries at Conoco Driscol Field, Benavides, Texas with 3 Foxboro Gas Flow Meters Type 4.

HERE'S THE WAY IT'S DONE

By taking advantage of the exclusive features built into Foxboro Flow Meters, you can cut meter inspection trips and recalibration to the bone . . . *and eliminate mercury losses completely*. You won't need to coddle these meters to get accurate records.

Foxboro Flow Meters are designed with a *unique straight-line linkage* that makes factory adjustments permanent. Their sustained accuracy is outstanding. Four to six years' service without recalibration isn't uncommon! In addition, floats of Foxboro Meters are *extra large* and have *extra long* travel. This means unequalled *power* . . . giving highest accuracy at the pen. *Sure-Seal Check Valves*, submerged in mercury, positively prevent mercury losses. And for freedom from friction and freeze-ups, Foxboro Pressur-Tite Bearings have never been equalled!

These are the reasons why experienced production men prefer Foxboro Flow Meters above all others . . . why you can cut metering costs without jeopardizing the accuracy of your records.

WRITE FOR Bulletin 351-2 for complete details.

The Foxboro Company,
60 Neponset Avenue,
Foxboro, Mass., U.S.A.

FOXBORO
REG. U. S. PAT. OFF.

MONEY-SAVING FLOW METERS

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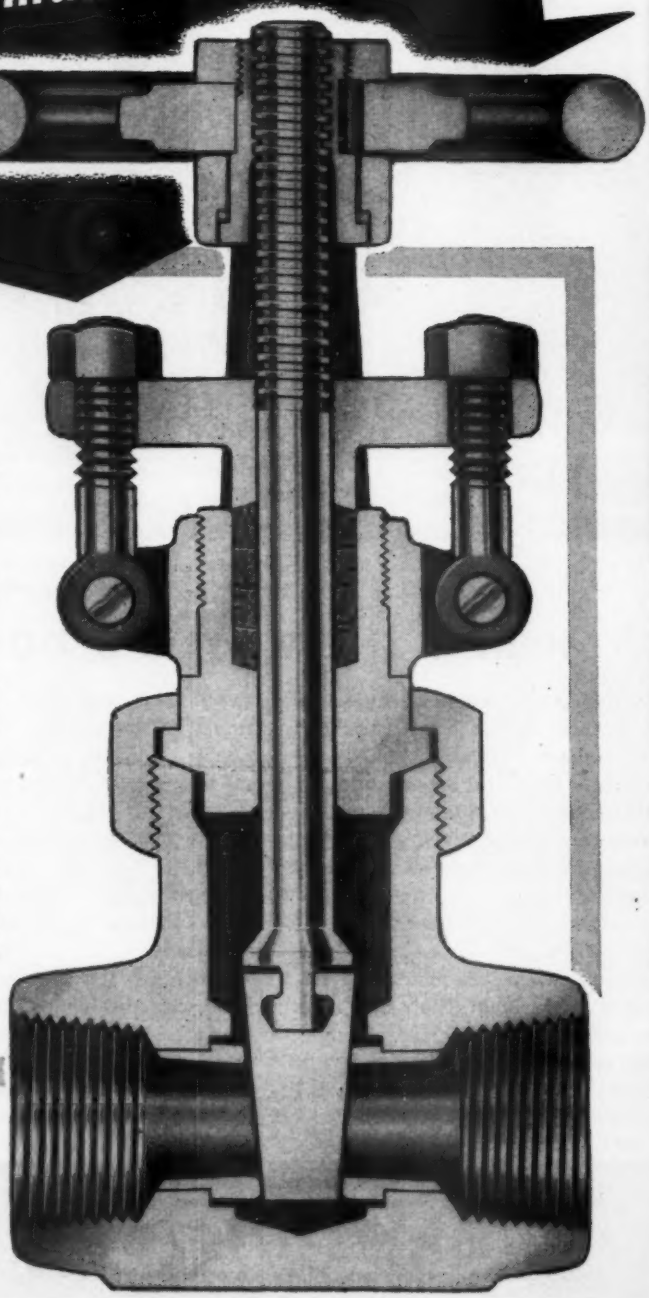
Here's Why You Get Lower Maintenance Costs with Chapman List 960



1. *Gaskets!*
Available with either metal to metal or gasketed joint as required.

2. *50% Stronger!*
New design features compensate at points where excessive strain can develop . . . make stem and wedge gate connection 50% stronger than before.

3. *Wear-Resisting Wedge Faces!*
To keep your maintenance cost down the wedge faces are hardened to 800 Brinell by the exclusive Malcomizing process.

4. *Replaceable Seat Rings!*
When necessary, you can replace the seat rings easily . . . fast. Seat rings have wear-resisting and non-galling properties . . . made extra hard for years more service.

5. *Full Pressure Repacking!*
No need for costly interruption of flow to repack.

But check this lower maintenance cost for yourself. Next time you buy specify List 960 in sizes from ¼" to 2". Rising stem with yoke (as illustrated) or rising stem inside screw type. For pressure range 2000 lbs. at 100 deg. F., 380 lbs. at 1000 deg. F. Specify List 990 for higher pressures.

The CHAPMAN Valve Manufacturing Company

INDIAN ORCHARD • MASSACHUSETTS

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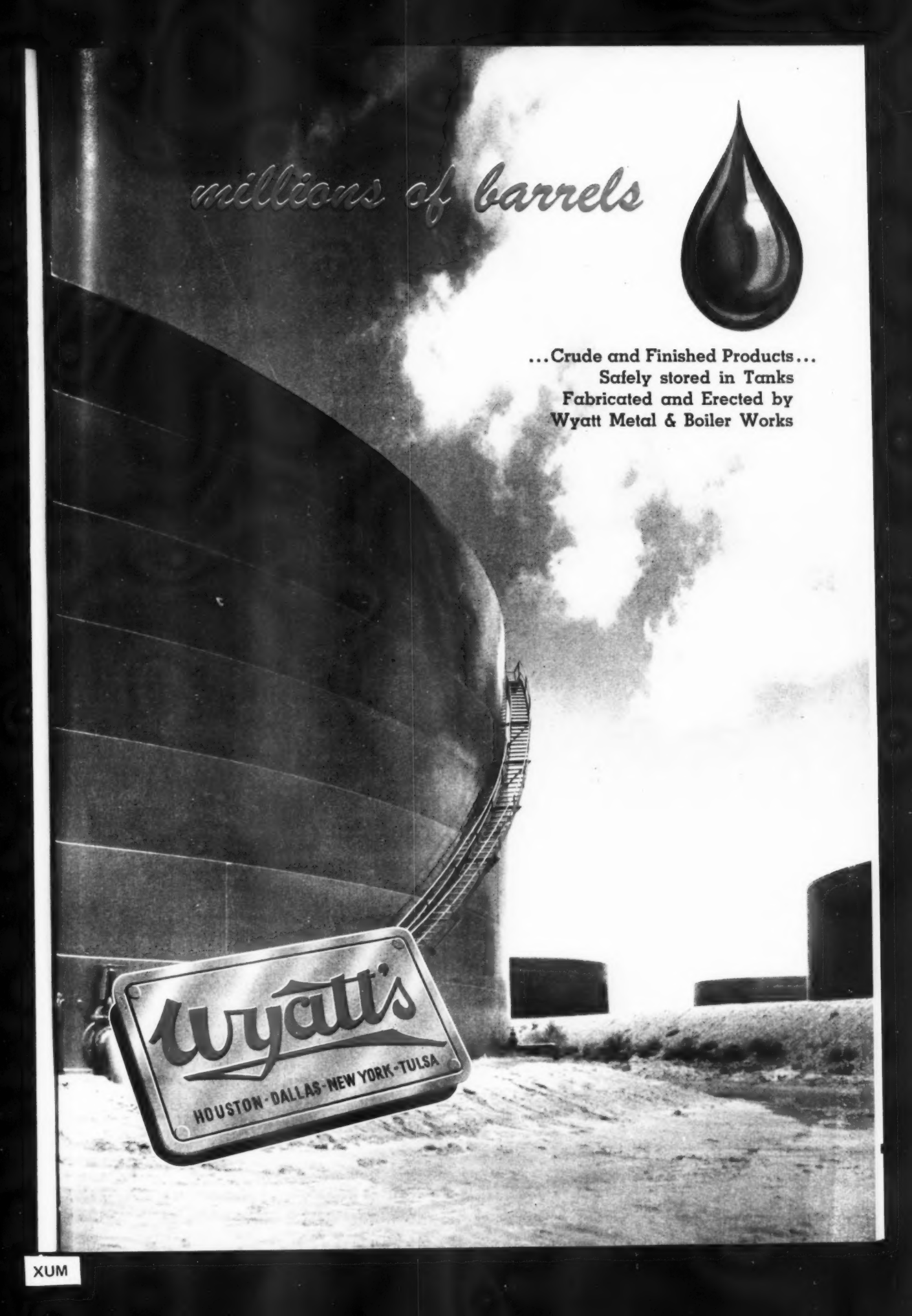
millions of barrels
...Crude and Finished Products...
Safely stored in Tanks
Fabricated and Erected by
Wyatt Metal & Boiler Works
wyatt's
HOUSTON-DALLAS-NEW YORK-TULSA

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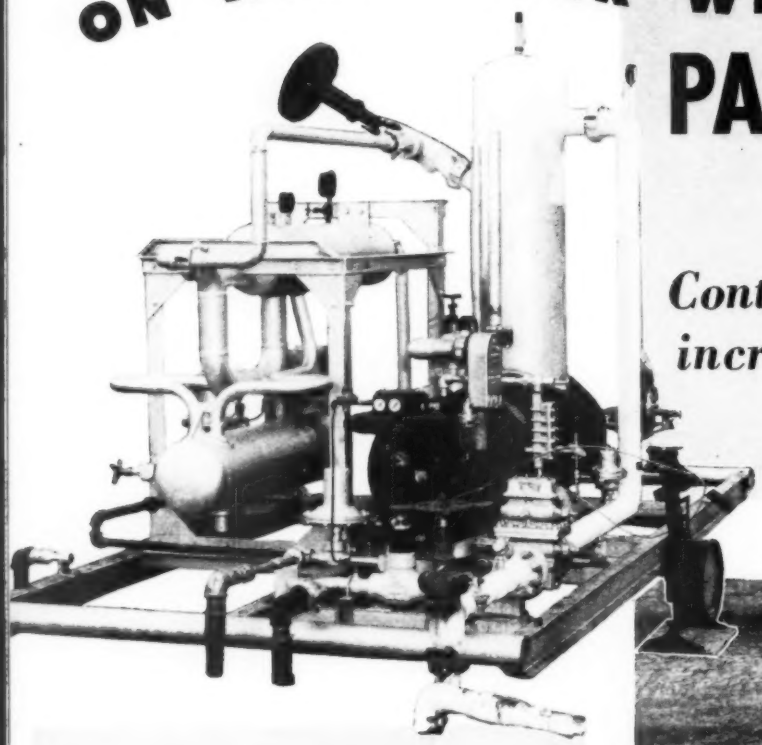
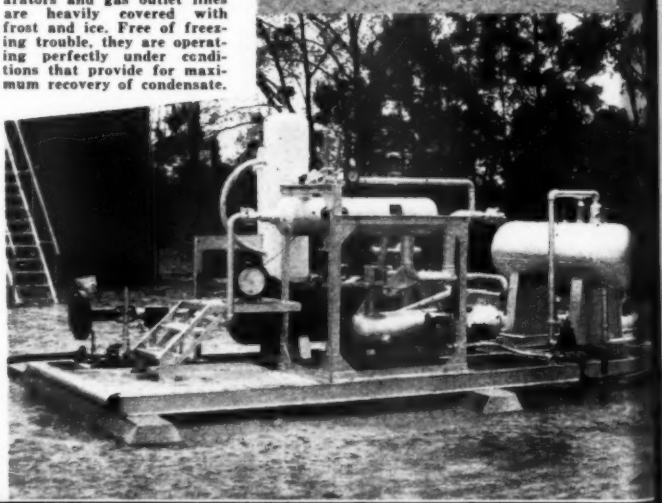
ON WELL AFTER WELL . . .



PARKERSBURG HYRECO

Continues to make record increases in condensate recovery

These three Hyreco Processing Units are operating at temperatures so low the separators and gas outlet lines are heavily covered with frost and ice. Free of freezing trouble, they are operating perfectly under conditions that provide for maximum recovery of condensate.



The records of field testing are being re-proved with every installation. Substantial increases in condensate recovery are bringing new profits to the owners of Hyreco Processing Units . . . are eliminating the expense of down time due to line freezing . . . are obviating the use of heaters and their costly operation.

For one user a 15% increase in condensate recovery meant 137 EXTRA barrels of hydrocarbons in 22 days.

This owner reports: "Condensate recovery increased from 25 barrels to 31.6 barrels for each million cubic feet of gas flowed."

"Net earnings from sale of increased condensate recovery are more than $900.00 per month over that which was possible with conventional installation," reports another Hyreco owner.

Investigate the profit producing performance of Parkersburg Hyreco. Ask your Parkersburg Representative for facts about its proven record. Write for Bulletin HR-650.

5020

PARKERSBURG

RIG & REEL COMPANY • Parkersburg, West Virginia

XUM

XUM

Producers
Refiners
Marketers

of petroleum products

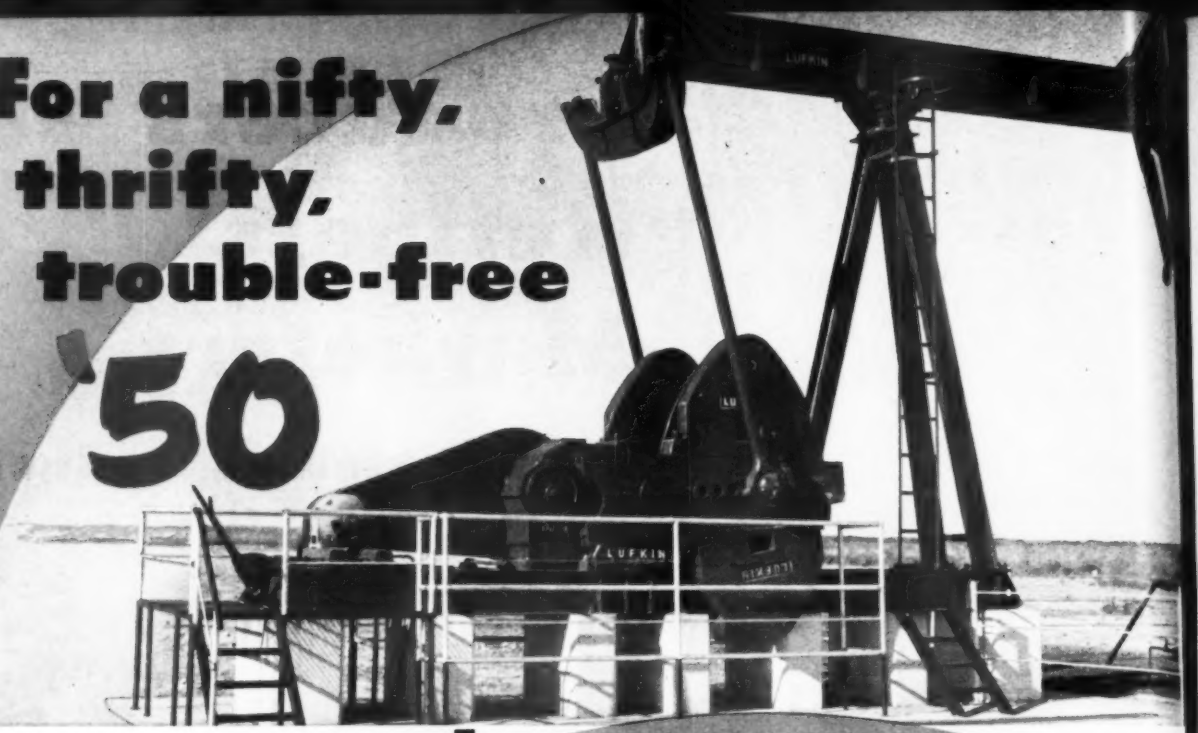
Be <u>sure</u> with Pure

THE PURE OIL COMPANY

Marketing Offices in Principal Cities of the Eastern, Central and Southern States
General Offices, Chicago, Illinois

XUM

For a nifty, thrifty, trouble-free '50



...use the Lufkin Line

Trouble-free Lufkin units will be more than ever appreciated in 1950. Lower operating and maintenance costs has been one of the outstanding characteristics of Lufkin oil field equipment. We invite you to be wise . . . economize and for a *nifty, thrifty, trouble-free* '50 . . . use the Lufkin Line. Get in touch with our nearest office for *complete* details.

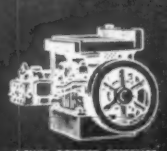
May we send you our newest commercial gear catalog?

Lufkin FOUNDRY & MACHINE COMPANY
LUFKIN, TEXAS

Branch sales and service Houston, Dallas, New York, Tulsa, Los Angeles, Seminole, Oklahoma City, Corpus Christi, Odessa, Kilgore, Wichita Falls, Casper, Wyoming; Great Bend, Kansas.

Lufkin Equipment in CANADA is handled by
THE LUFKIN MACHINE CO., LTD.
14321 108th Avenue, Edmonton, Alberta, Canada

LUFKIN PUMPING UNITS


LUFKIN-COOPER-BESSEMER ENGINES

LUFKIN OIL FIELD AND INDUSTRIAL TRUCK TRAILERS

INDUSTRIAL SPEED REDUCERS AND INCREASERS

DIVISION LUFKIN FOUNDRY & MACHINE COMPANY
INDUSTRIAL, MILL AND AUTOMOTIVE SUPPLIES

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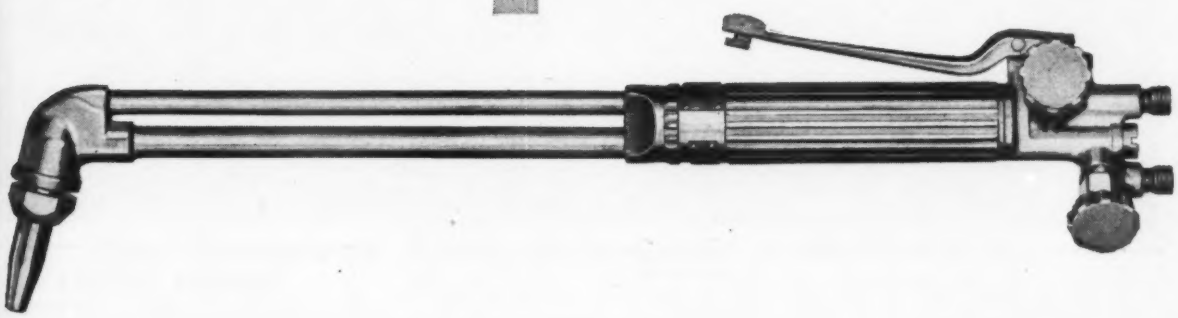
Do all this with *One* OXWELD Trade-Mark Blowpipe

- **Cut steel up to 12 in. thick**
- **Bevel parts for fabrication or repair**
- **Gouge grooves of many sizes and contours**
- **Deseam semi-finished steel forms**
- **Cut risers and "wash" pads**
- **Prepare plate edges for welding**
- **Remove rivets and pierce holes**
- **Trim plate and structural shapes**
- **Powder-cut stainless steels and other oxidation-resistant metals**
- **Cut guided circles and straight lines**
- **Scrap obsolete equipment for profit**



Whether your work includes one or more than one of these jobs, the OXWELD C-32 Blowpipe will save you time and money. This all-purpose cutting blowpipe, with its wide variety of inexpensive nozzles and attachments, easily handles these jobs—and many others—with outstanding efficiency, speed, and convenience.

Like all OXWELD products, the C-32 is built to give you many extra years of economical and **trouble-free service** under every condition of use. Available in your choice of 3 lengths (20-, 26-, and 32-in.) and 3 head angles (75-, 90-, and 180-deg.) to suit your exact needs. Write or phone today for full information about this cutting blowpipe — or regarding welding blowpipes, regulators, cutting machines, or acetylene generators.

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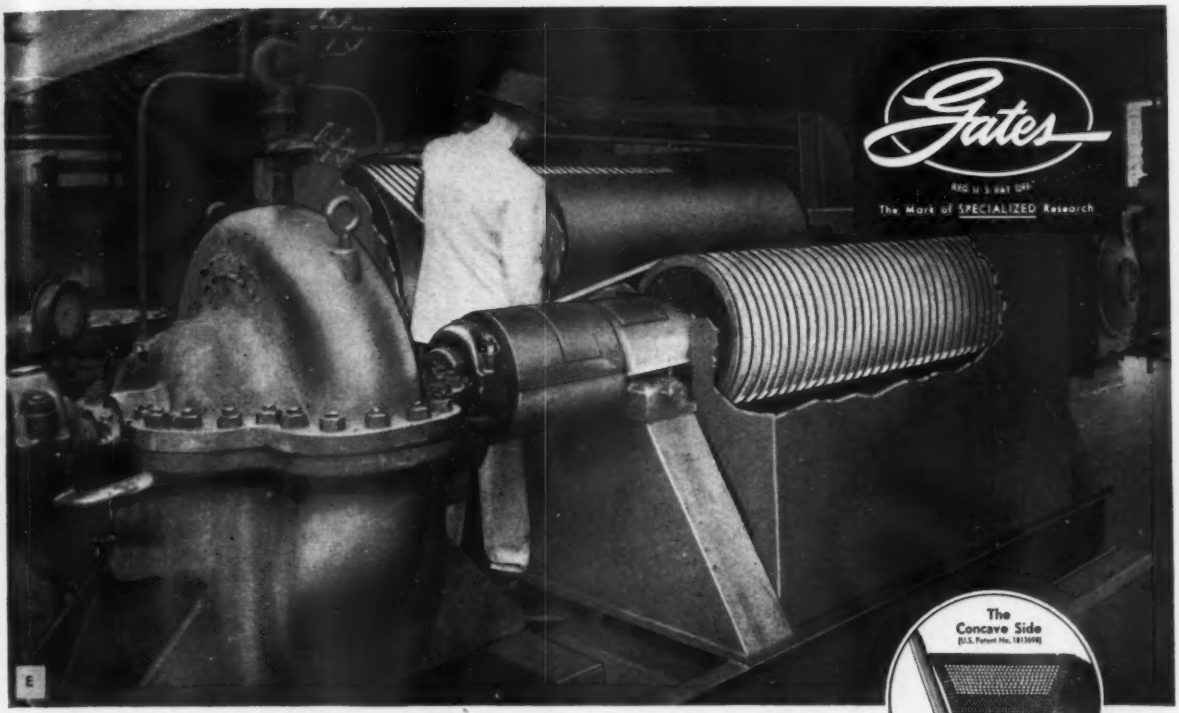


This is one of four identical Gates Vulco Rope Drives in Humble Oil's vast refinery at Baytown, Texas, each of which transmits 650 horsepower from a Diesel engine to a centrifugal pump. In designing the drives, the idler (needed for belt take-up) was so placed as to increase the wrap of the belts around the large pulley to the point where that pulley could be flat—saving the cost of a large grooved sheave.

Let this simple test tell you exactly WHY the Concave Side cuts your V-Belt costs

To see for yourself the belt-saving importance of the Concave Side, just pick up *any* V-belt and bend it as it bends when it goes around a pulley.

As the belt bends, grip its *sides* firmly with your fingers. You will feel the sides of the belt *change shape.* This is because the top of the belt is under tension and, hence, grows *narrower* while the body, under compression, *bulges out.* (See figure 1 and 1-A)

Now look at figures 2 and 2-A. There you see how the bending changes the shape of the belt that is built with the Concave Side—The Gates Vulco Rope. The concave sides of this belt merely *fill out* and become perfectly *straight.* There is no side-bulge. This belt, when bent, *precisely fits its sheave groove.*

A very distinct saving in belt wear results. No side-bulge means that the sides press *evenly* against the V pulley and therefore wear *uniformly*—resulting in longer life for the sidewall and, naturally, *longer life for the belt!*

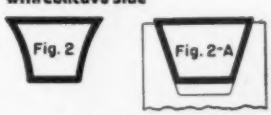
If you care about cutting your belt costs, it will pay you to make sure, whenever you buy V-Belts, that you get the V-Belt with the Concave Sides...the Gates Vulco Rope!

What Happens When a V-Belt Bends

Straight-Sided V-Belt

How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear at Point Shown by Arrows.

Gates Vulco Rope with Concave Side



The Concave Side Fills Out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-508

THE GATES RUBBER COMPANY
DENVER, U.S.A.
World's Largest Makers of V-Belts

GATES VULCO ROPE DRIVES
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See O-C-T Equipment on display at the Permian Basin Oil Show, Oct. 19-22.

● Blowouts happen fast and a profitable drilling operation can change to a blazing financial disaster in a matter of minutes. So don't throw away your blowout protection at the last minute for a matter of hours. O-C-T C-19 Casing Heads eliminate open hole hazards because they provide a positive casing seal and suspension before blowout preventers are removed. When dropped through preventers, suspension and seal are automatically effected. The Hycar packing seal also provides added protection against blowouts from above the top of the cement around the oil string while drilling. Give your well this exclusive O-C-T protection. Ask your O-C-T Representative or write for complete details.

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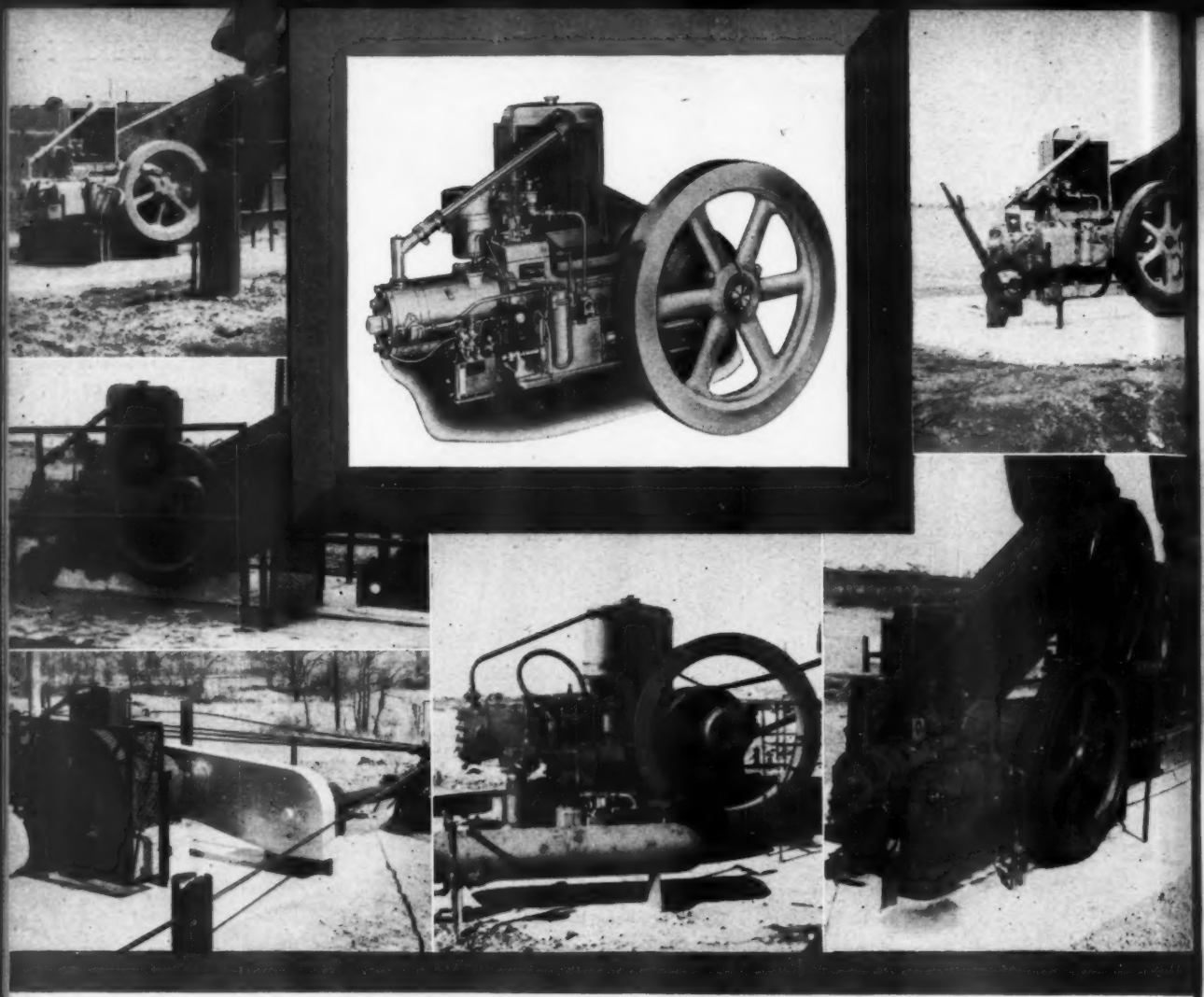

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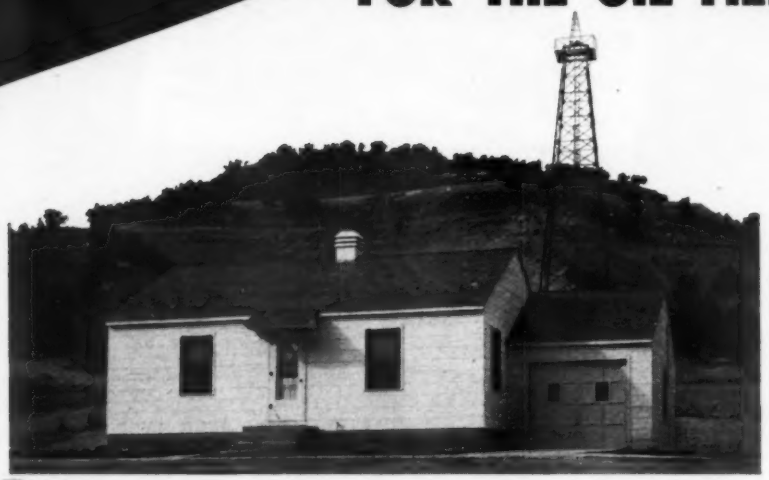
WHY STURDYBILT PREFABRICATED HOUSES FOR THE OIL FIELDS?



STURDYBILT Houses have ALL the advantages of conventional houses, and NONE of the disadvantages. STURDYBILT Houses are weather-tight, constructed to last, and are roomy, comfortable and beautifully designed.

STURDYBILT Houses, because they are prefabricated at the factory, can be moved to any site, erected in days instead of weeks or months, and are easily taken down and transported to another location with little or no loss of material.

Investigate STURDYBILT Prefabricated Demountable Houses today.

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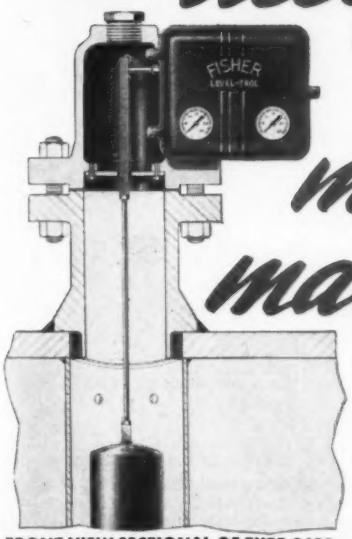
STURDYBILT HOUSES COMPLY WITH COMMERCIAL STANDARD CS125-45 OF THE NATIONAL BUREAU OF STANDARDS FOR PREFABRICATED HOMES

TYPE 2405-249
EXTERNAL MOUNTING
LEVEL-TROL

6 years of proven field acceptance with minimum maintenance

FISHER® LEVEL-TROL



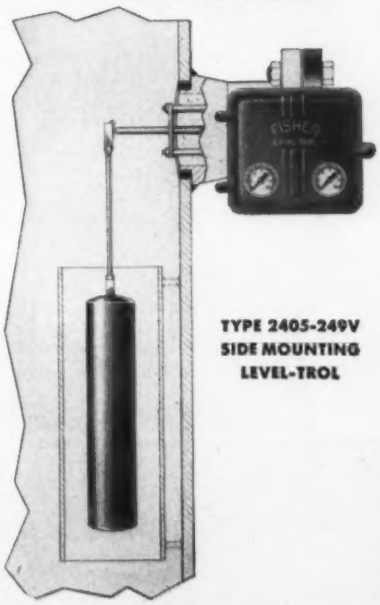
FRONT VIEW SECTIONAL OF TYPE 2405-249P TOP MOUNTING LEVEL-TROL

Fisher Level-Trol is designed for accurate and precise control of all liquids at all specific gravities and temperatures. Available in internal or external mounting constructions for indicating or controlling liquid level.

TYPE 2405 LEVEL-TROL PILOT

Features

- Pilot is entirely pneumatic in operation. No intervening links or mechanical joints.
- One control knob with calibrated scale for proportional band and specific gravity adjustment.
- Torque tube can be exchanged or replaced without dismantling entire level controller or breaking into pressure piping.
- High-tensile iron, pressure-tight weatherproof case with hinged gasket sealed cover.
- 8 flanged and screwed mounting connection combinations with 8 standard cage lengths from 14" to 120".



TYPE 2405-249V
SIDE MOUNTING
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MARSHALLTOWN, IOWA

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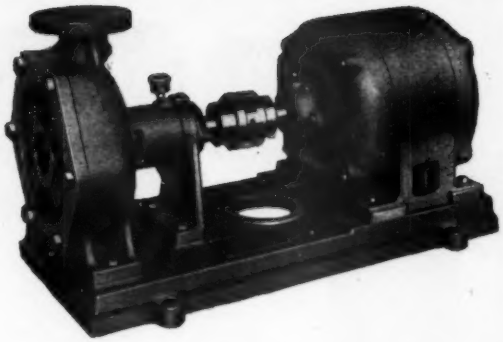
Transit Type CS Pumps

FOR CHEMICAL, PROCESSING AND GENERAL SERVICES



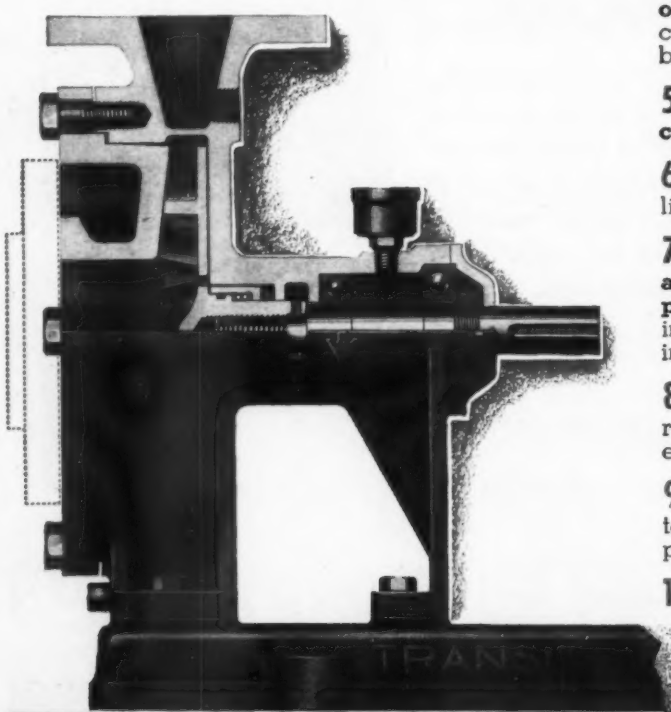
Max. working pressure 200 ppsi, 200 °F., 150 lb. Flange Drilling.

Capacities up to 550 G P M, differential heads to 160'.

Designed to give maximum strength, dependability, efficiency, and simplicity at minimum cost.

Ask for Bulletin 6100.

For Higher Pressures, Capacities and Temperatures, ask for Bulletin 6000, Transit Type ES.



COMPARE THESE FEATURES

1 **A balanced mechanical seal** which can be repaired from impeller end without making any precision measurement and without disturbing the shaft, bearings, coupling, driver, or discharge piping.

2 **Supported directly under the case** for maximum strength and freedom from piping strains.

3 **Case and bearing bracket are one integral casting** of the same metal for maximum strength, true alignment and 100% corrosion protection.

4 **No threads, and minimum number of parts exposed to the line fluid.** All parts can be furnished in any metal or alloy which can be cast and machined.

5 **Totally enclosed stainless steel clad case gasket** which can be reused many times.

6 **Extra heavy cases and impellers** for liberal corrosion and erosion allowances.

7 **The least number of parts per pump and the maximum interchangeability of parts between sizes.** Six sizes with all parts interchangeable except case, end cover and impeller.

8 **Extra heavy shaft and bearings** with running clearance easily adjusted for maximum efficiency.

9 **Discharge nozzle** is vertical and is located at center of pump for venting and to simplify piping.

10 **Minimum floor space** required.

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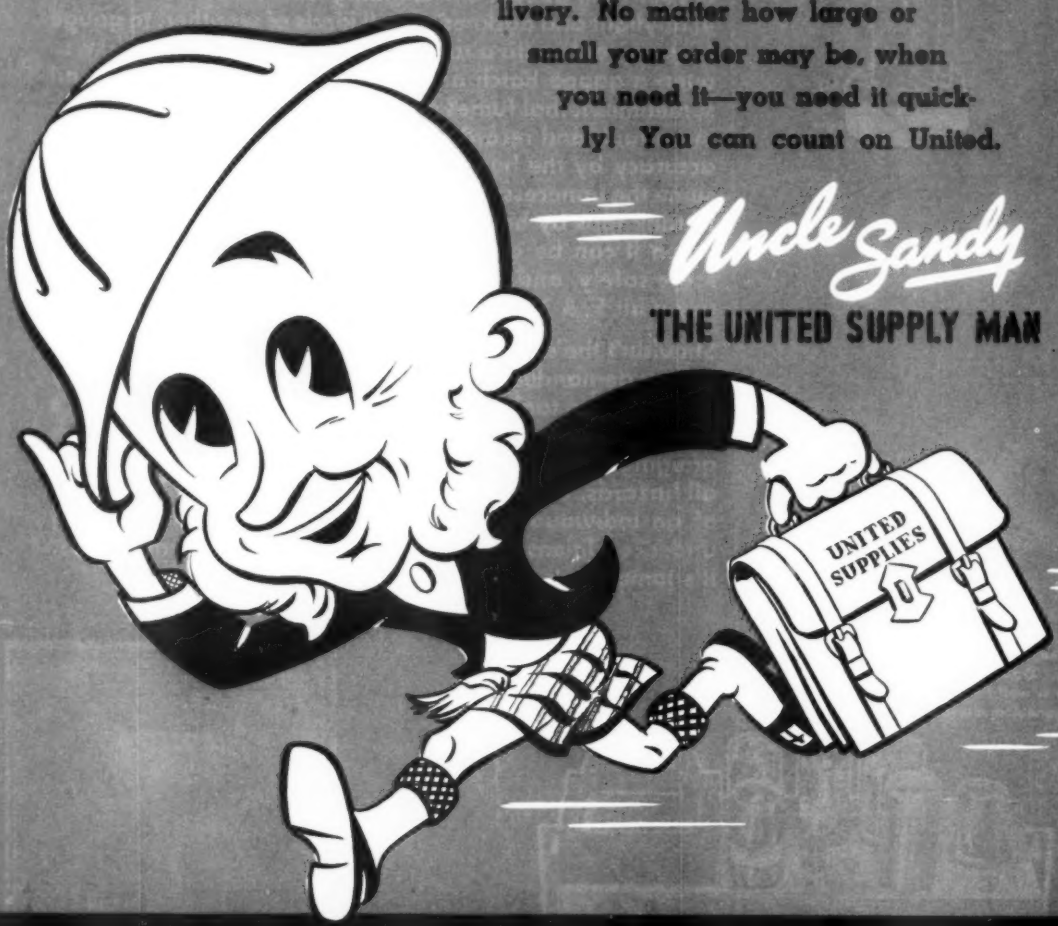
THE UNITED SUPPLY MAN



Courtesy
Service
Dependability

UNITED SUPPLY
AND *Manufacturing* COMPANY
TULSA, OKLAHOMA
Stores in Kansas, Oklahoma, Texas, Louisiana, and New Mexico

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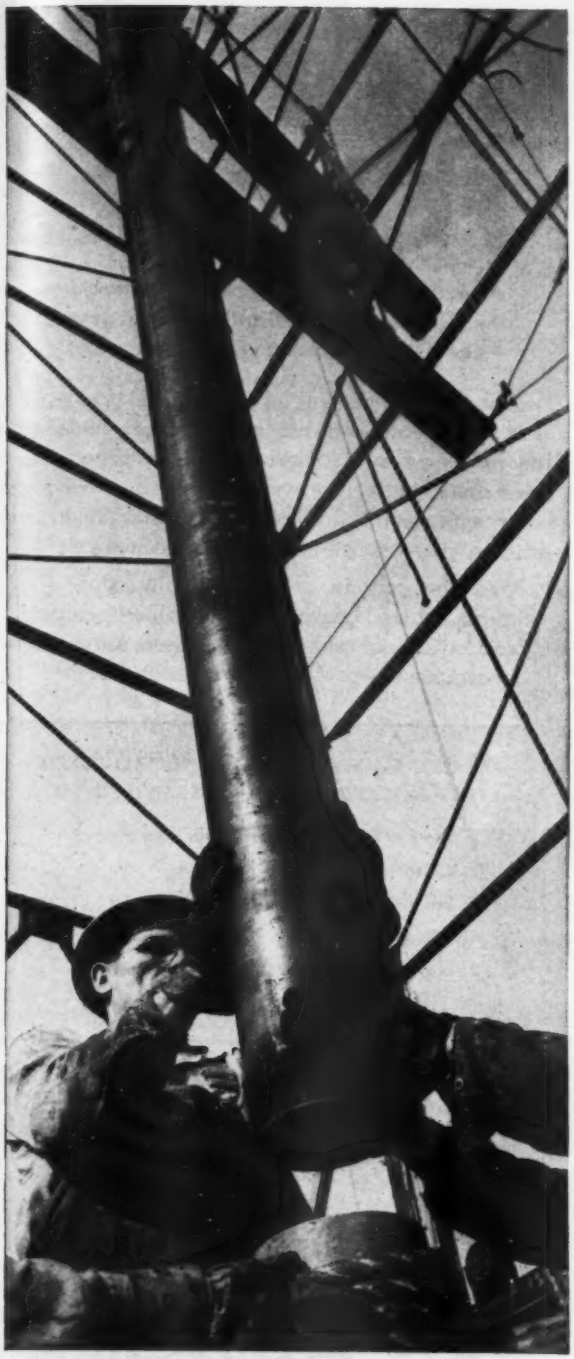

"These threads show no sign of loosening..."

—says a Texas drilling supt.

● "Experience has proved to me that these threads show no sign of loosening even after a long period of time," said this Texas drilling superintendent. He made his observation after watching the setting of a string of 7-inch H-40 Republic Electric Weld Casing, and the completion of the well with 2⅞-inch H-40 Republic Electric Weld Tubing.

No doubt about it! Threads cut in Republic Electric Weld Tubular Goods always are clean and full-formed . . . accurately gauged for size, depth, lead and taper. They stab, spin-in and tong-up fast . . . and *tight*. They take hold with a bulldog grip.

In Republic's advanced Electric Weld Process, casing and tubing wall thickness and roundness always are uniform. Thread-cutting leaves a uniform depth of tough steel under thread roots all around the pipe. No pull-out-inviting thin spots occur.

Be sure that you get the protection of threads that "show no sign of loosening" by specifying Republic Electric Weld Casing and Tubing.

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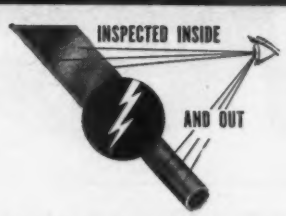

Republic Electric Weld Casing and Tubing are made from flat-rolled steel, both sides of which are inspected. Thus, the surface which becomes the inside wall is free from hidden defects.

REPUBLIC *Electric Weld*
NORMALIZED CASING AND TUBING

REPUBLIC STEEL

Other Republic Products include Line Pipe—Carbon, Alloy and Stainless Steels—Upson Studs, Bolts and Nuts—Electrunite Heat Exchanger Tubes

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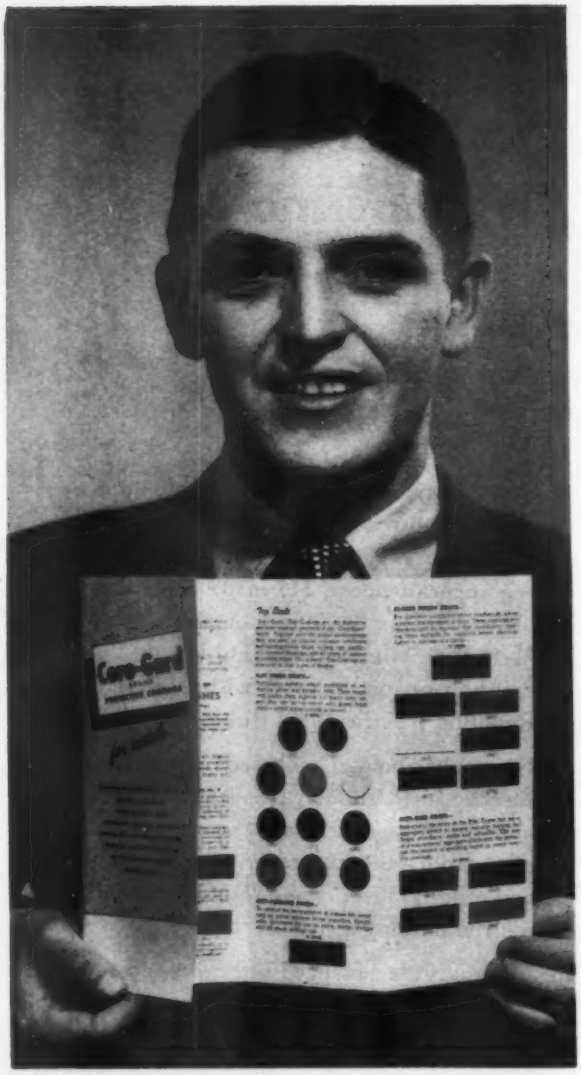

FREE FOLDER!

Actual color samples and finishes show how the 15 basic "Coro-Gard" coating systems can give long-lasting protection to metal.

Just off the presses!—An informative new folder that shows you how you can solve your metal coating problems with "Coro-Gard." It gives you 15 basic metal protective systems, together with actual color samples of anti-corrosion, flat finish, anti-fouling, glossy finish and anti-skid coatings.

Mail the coupon below for your copy of this valuable folder. Learn why equipment subject to corrosion and abrasion lasts longer, requires less maintenance when "Coro-Gard" is on the job.

FOLDER SHOWS CORRECT "CORO-GARD" COATINGS FOR METAL SUBJECTED TO—

1. **Severe Fresh or Salt Water Exposure**
2. **Chemical Fumes & Spillage**
3. **Sour Crude Petroleum & Gasoline**
4. **Abrasion**
5. **Normal Exposure**

AND MANY OTHERS

LATEST AID to metal coating problems is this folder of "Coro-Gard" color samples and protective systems. Handy chart shows 28 different finishes and colors to help you solve your *specific* problem. Mail coupon today.

WHATEVER your corrosion problem, there's a "Coro-Gard" Coating System to save you time and money. Our engineers have prepared metal coating systems to satisfy every need. Mail coupon for informative folder.

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Adhesives & Coatings Division
411 Piquette Avenue
Detroit 2, Michigan

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WRITE TODAY for handy folder showing how to cut the cost of treating equipment, prolong the interval between coating and re-coating. Address our Adhesives and Coatings Division in Detroit.

Made in U.S.A. by MINNESOTA MINING & MFG. CO., ADHESIVES AND COATINGS DIV., 411 Piquette Ave., Detroit 2, Mich. Also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives. General Offices: Saint Paul 6, Minnesota.

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Engine keeps going, oil keeps flowing with the help of TIMKEN® bearings

THE photo at right shows the Climax Model C-66 engine, driving an Emsco pumping unit in Texas—a tough job requiring tough bearings.

To provide for continuous, trouble-free service, Climax designers mounted the crankshaft of this engine on Timken® tapered roller bearings. The low speed shaft of the Emsco pumping unit gearbox is also mounted on Timken bearings.

PROVIDES POSITIVE ALIGNMENT

Timken bearings keep the crankshaft in positive alignment, reducing deflection and end-play. Yet they permit the crankshaft to turn freely by minimizing friction. The tapered construction of Timken bearings takes all radial, thrust and combination loads. And line contact between rollers and races gives them greater load capacity. Timken bearings also permit tighter closures that keep lubricant in, dirt out. And they normally last the life of the machine.

MAINTENANCE COSTS CUT

As a result of these outstanding features, Timken bearings reduce maintenance costs, insure dependable, "non-stop" operation, and prolong the life of any oil field equipment they're used in.

Make sure the equipment *you* build or buy has these advantages by looking for the trade-mark "Timken" on every tapered roller bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

CLIMAX ENGINE & PUMP MFG. CO. *mounts the crankshafts of its Blue Streak engines on Timken bearings for continuous, trouble-free operation with a minimum of maintenance.*

POSITIVE ROLLER ALIGNMENT
Wide area contact between roller ends and rib of the cone prevent Timken rollers from skewing. Result: bearings roll easier, last longer.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

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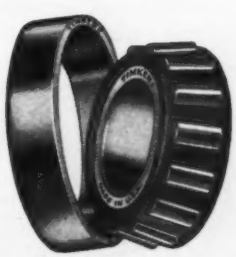
TAPERED ROLLER BEARINGS



NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION →✳←

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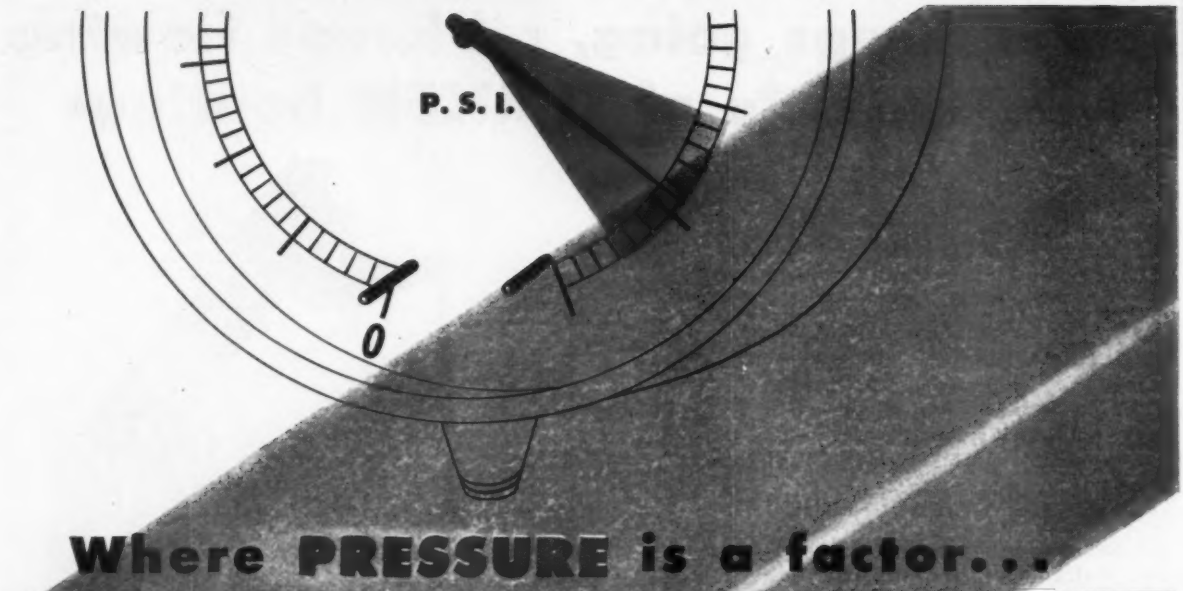


Where PRESSURE is a factor...

GUN IRON CASTINGS

IF YOU require pressure castings, it will pay you to investigate Gun Iron. First of all, the dense, close-grained micro-structure of Gun Iron is ideally suited to pressure type, leak-proof castings. Added to this, in our foundry you find all the modern controls, equipment and procedures required to assure uniform, porosity-free castings in any size and with the most intricate coring.

These are but two of the important reasons why Hunt-Spiller Gun Iron has been preferred for pressure, wear-resistant and other types of high quality castings for 139 years. To cite one application where pressure is an important factor, Hunt-Spiller produces many of the cylinder heads for leading manufacturers of diesel engines. Frequently, we also finish machine the heads in our manufacturing department to provide complete quality control from furnace to foundry to finished product.

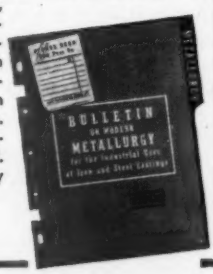
Our engineers stand ready to help you determine the value of Gun Iron and its alloys for your cast parts. Why not investigate right away?

GUN IRON *in the* PETROLEUM INDUSTRY

Hunt-Spiller casts and machines many parts for the petroleum industry. A few are listed below:

LINERS, PISTONS AND RINGS FOR HOT OIL PUMPS • BUBBLE CAPS AND TRAYS • TUBE SUPPORTS • PRESSURE CASTINGS

Chances are that there are many other places where Gun Iron can solve a design or operating problem. To help you determine the value of Gun Iron for your cast parts, our metallurgical department has prepared a comprehensive bulletin which contains complete properties and discussions of Gun Iron and many other metals. Engineers claim it an invaluable reference aid. Send for your free copy today.



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Du Pont Offers...

A MOVIE THAT SELLS THE "QUALITIES" OF GOOD GASOLINES—A seventeen-minute, four-color, animated, motion picture that talks the service station man's language but tells your quality story.

AN EASILY UNDERSTOOD CARTOON BOOKLET TELLING GASOLINE QUALITY STORY—A colorful and interesting summary in cartoon form, of the film story for your imprint and distribution either at film showings or separately.

A QUARTERLY NATION-WIDE MOTOR GASOLINE SURVEY—Compiled from service station samples picked up in all major market areas. Shows motor and research octane ratings of both premium and regular fuels by individual brand (identified by code symbols so you can pick out your own). City averages are also given.

A TRAVELING FUEL TEST FLEET—Now touring the country, these specially instrumented cars graphically demonstrate to your customers what goes into making a good gasoline to insure top road performance. These cars are also available when in your area, for road tests of your fuel.

SPEAKERS AND PROGRAMS FOR DEALER EDUCATIONAL MEETINGS—Du Pont will provide speakers and will help you plan interesting and instructive programs for dealer sales and service meetings. Talks may be selected that are technical or semitechnical in nature as desired.

INSTRUCTIVE FIELD LABORATORY SESSIONS FOR MARKETING PERSONNEL—Arrangements may be made for instructive tours of the Du Pont Field Laboratories by your sales engineers or other marketing group personnel. Demonstrations and explanations of testing methods will be given them.

HELP FOR USERS OF YOUR FUELS—Analysis of fleet and bus operating difficulties by Du Pont automotive authorities—safety and medical supervision and advice on TEL handling, tank cleaning and the like in bulk plants are all available from Du Pont.

Ask your Du Pont Petroleum Chemicals representative how you can obtain these services.

USE DU PONT TETRAETHYL LEAD COMPOUNDS

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Better Things for Better Living
...through Chemistry

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Du Pont Provides A Complete Line of Gasoline Additives To Give Your Fuels Their Salable Qualities

Du Pont provides you with one dependable source from which you can obtain *all* of the additives needed to give your gasoline the qualities by which motorists will identify it.

Tetraethyl Lead Compounds, (Motor Mix and Aviation Mix) provide an economical method of securing a desired octane rating.

Antioxidants, Nos. 5, 6 and 22, provide a choice from which one can be selected for minimum cost with maximum assurance of ample storage stability.

Metal Deactivator, by controlling copper effectively, often reduces antioxidant needs sufficiently to effect a major economy and thus helps produce a better fuel at lower cost.

Dyes, in a complete range of colors, are all readily soluble in gasoline and permit the positive color identification of your fuel.

DID YOU KNOW

That Du Pont "Lucite" acrylic resin, as used in illuminated signs, is being utilized by oil companies to identify their service stations? Its ability to bend light and its ease of maintenance make a sign that is both effectively eye-catching and economical.

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They Say—

Industry Is Ready

"Even with the sudden outbreak of a global war, the oil industry would be ready to provide all the gasoline, jet fuel, and heavier oils required. Our production and refining capacities have increased tremendously since World War II.

"There's plenty of oil. Our oil stocks are in wonderful shape—by stocks I mean our plant inventory, reserves, and ability to convert to war production.

"If we get into a big war, we won't need oil from Venezuela or the Near East. Besides the huge American capacity, we've got other vast sources in Canada and Mexico.

"Even with the great new uses for oil—mechanization of farms, tremendous use of diesels, increased oil heating—we are producing a great surplus of oil.

"This business about us running out of oil in 20 or 30 years is foolish. . . . We're not out of oil and it doesn't look like we will be for thousands of years, especially with our new methods of making synthetic oil."

B. L. Majewski, vice president, marketing, Deep Rock Oil Corp., Chicago.

Looking Ahead

"The world's petroleum reserves are now down to about a 50-year supply at the present production rates. Even with new resources which will almost certainly be discovered it will probably be difficult to meet world demands.

"The outlook for coal and lignite reserves is much more reassuring to a scientist. Both the United States and Russia have reserves of fossil fuel to last at least 2,000 years. Britain's reserves can be mined economically for only 200-300 years more."

Dr. Alexander Parker of the British Department of Scientific and Industrial Research in a lecture sponsored by British Association for the Advancement of Science.

A Dangerous Business

"Yours (the oil industry) is a dangerous and hazardous business. It has developed into one of the greatest and most useful industries in the world because men of courage, vision, and initative took great risks, both personal and financial. . . . The search for oil has gone forward. It has led men with the spirit of adventure into the most inaccessible places. They endured hardships and back-breaking toil . . . but they went ahead with peristance, resourcefulness, and en-

"68% SAVED ON TANK & OVERHEAD MAINTENANCE"

reports Superintendent A . . . . . with

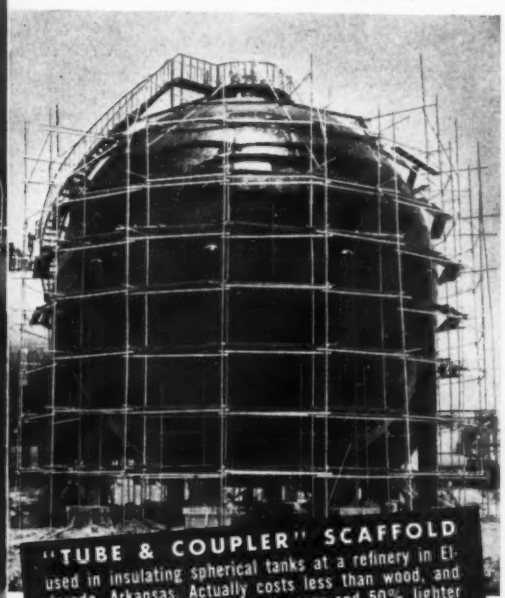
Aluminum Alloy

"UP-RIGHT" SCAFFOLDS

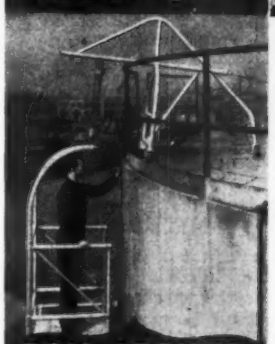
Here's a completely new and faster way to get up in the air and move with the job. Petroleum users everywhere report time and labor savings over old-fashioned methods. In fact, savings on even single jobs more than covered the cost of the scaffolds. Indispensable for efficient tank paintings, inspection, control, gaging and general overhead maintenance. Eliminates need for many costly fixed stairways and ladders. No rust . . . no corrosion . . . non-sparking.

15 MINUTES TO ERECT 45 FT. "MOBILE TOWER"

A tower of any other height desired can be erected by using the required number of standard 6' or shorter sections. Patented one-piece section has built-in stairway. Folds flat for storage.



"TUBE & COUPLER" SCAFFOLD used in insulating spherical tanks at a refinery in Eldorado, Arkansas. Actually costs less than wood, and can be used repeatedly. ⅓ stronger and 50% lighter than conventional "iron pipe" scaffolding. No rust or corrosion. Flexible—build any shape scaffold you need, and in half the time.



ROLL-AROUND & SAFETY CAGE

Provides new, faster method for covering entire wall areas of tanks. Can be rigged by one man. Roll-Around is anchored to eyebolt on top of tank. Safety cage is raised or lowered while rolling around.

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PEERLESS PUMPS PREFERRED

VERSATILE CONTINUOUS-DUTY GENERAL PURPOSE TYPE A PEERLESS PUMPS

Peerless Type A Horizontal Centrifugal Pumps Used in Gas Booster Station for Handling Jacket Cooling Water

Peerless Type A general purpose horizontal centrifugal pumps are preferred by this large producer of natural gas, for a host of reasons. Here are a few of the features that contribute to their unsurpassed performance:

1. Employ duplex angular contact thrust bearings for longer life and lower maintenance cost, under heavy continuous or intermittent duty.
2. Bearing housings have double-wall construction; first, to insure against any distortion of ball race and second, to provide water-cooling space between walls.
3. Impeller rings are generously wide and grooved; efficiency is increased by minimizing leakage between suction and discharge chambers.
4. Heavy case rings, with ribs on both ends, provide extra strength, prevent distortion and effect a seal against leakage.
5. Shaft sleeves, locked against direction of rotation by right and left hand threads at impeller hub, prevent shaft distortion when handling hot liquids.
6. Incorporate five rows of heavy duty packing and utilize an in-and-out water seal connection for use when handling hot liquids.

These general purpose pumps are completely described in Peerless Bulletin B-1300. Write for your copy.

TYPE A PUMP CHARACTERISTICS

CAPACITIES: Up to 70,000 GPM
HEADS: Up to 300 Ft.
SIZES: 1¼" to 48"
LIQUID TEMPERATURES: Up to 300° F
SINGLE STAGE—DOUBLE SUCTION HORIZONTAL SPLIT CASE

APPLICATIONS:

BOOSTER STATIONS
WATER SUPPLY
COMMERCIAL BUILDINGS
INDUSTRIAL PROCESSING
WASTE DISPOSAL
COOLING AND REFRIGERATION
FIRE PROTECTION

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FOOD MACHINERY AND CHEMICAL CORPORATION
Factories: Los Angeles, California, and Indianapolis, Indiana.
Offices: New York, Atlanta, Chicago, St. Louis, Phoenix, Fresno, Los Angeles; Dallas, Plainview and Lubbock, Texas; Albuquerque, N. M.

terprise. They relied on their own efforts and energy . . . they didn't look to the Government for grants, loans, or subsidies. They raised their own capital.

"Today the average citizen takes all these things for granted. But it should be remembered that the oil and gas industry . . . came up the hard way."

U. S. Senator Edward Martin, of Pennsylvania, in an address at the annual meeting of the West Virginia Oil and Gas Association, Weston W. Va.

Tidelands Talk

"The states have developed the tidelands and have a sensible policy with regard to them. They can obtain a higher return with less politics and favoritism than the federal Government can.

"About all the federal Government can accomplish is to stop production. If they want oil wells developed and oil produced during this interim then they should let the states do it."

Sen. B. Russell Long of Louisiana.

The Big Boss

"Who is The Big Boss in our industry and all other industries? It is the customer.

"Possibly that is the most important factor in our free-enterprise system.

"We take pride that our industry has been a rapidly growing industry from away back. It is about 90 years old. Unlike a new industry, it is much harder to achieve a spectacular rate or growth as one approaches maturity.

"Our company has spent about $850,000,000 since the end of the war in expanding our facilities and improving our quality. The net result is an expansion averaging about 40 per cent. That sounds low compared to such new industries as radio and television, but in an industry the size of ours it is a staggering rate of expansion, something of which we are very proud; and it has grown because the customer is boss and our job has been to meet the demands of the customer as rapidly as they grew."

Dr. Robert E. Wilson, chairman of the board, Standard Oil Co. of Indiana, speaking in Chicago.

West Coast Warning

"Without self-interest I warn you that there is no more important antitrust suit now pending than that against the seven largest West Coast oil companies.

"The Department of Justice has said it is only the first of a series of suits against the oil industry to be filed across the nation. The pattern is established. It is a drive against size and integration in the oil industry.

"If the antitrust lawyers get what

YOU can STOP RUST . . . PREVENT RUST . . . on *all* your rustable metal surfaces with RUST-OLEUM. Every day, rust eats away on your metal tanks, pipelines, drilling and pumping machinery, metal buildings, roofs and fences. Yet, rust *can* be stopped and protection given economically with RUST-OLEUM.

For more than a quarter of a century RUST-OLEUM has been *proved* under severe conditions of weather, fumes, salt air, salt spray, and other rust producing conditions. Railroads, shipyards, builders, refiners . . . nationally known users* in almost every field of industry . . . have found RUST-OLEUM the economical way to stop rust and prevent further rust. Architects, builders, engineers, maintenance men now specify RUST-OLEUM for primer, "shop coat", and finish coats.

RUST-OLEUM adds extra life to metal buildings, equipment and other metal surfaces and can be applied over already rusted surfaces without extensive surface preparation. Yet, RUST-OLEUM costs no more than most quality materials.

RUST-OLEUM not only protects—it beautifies as well! RUST-OLEUM is available in a large selection of colors including aluminum and white. It spreads evenly . . . and dries free of brushmarks in 4 to 12 hours, depending on conditions, to a tough, pliable film that protects against rust.

Be sure you get *only* genuine RUST-OLEUM for positive protection against rust! Specify *RUST-OLEUM* to your contractor or architect on any new construction, remodeling or maintenance work.

RUST-OLEUM is stocked and sold by leading industrial distributors in all principal cities of the United States and Canada. See Sweets for complete catalog and nearest source of supply, or write us direct for complete information.

*Names on request

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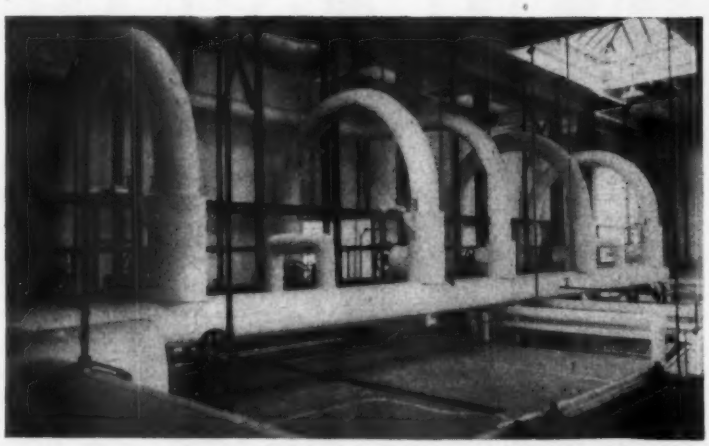

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Now available in pipe covering and block insulation, Mundet 85% Magnesia permits new heat-saving efficiency. Precision manufacturing on the latest type of automatic equipment insures uniform standards. Extra durability is built into the insulation. It does not "powder", settle or disintegrate. It is unaffected by either steam or water leakage. It maintains an attractive, smooth finish. Precision pipe fit is assured, with no spaces left for the escape of heat. You benefit from the most modern manufacturing facilities for the production of heat insulation. Write for specification information and recommendations. Mundet Cork Corporation, Insulation Division, 7101 Tonnelle Avenue, North Bergen, N. J.

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SAN FRANCISCO 7 440 Brannan St.

In Canada: Mundet Cork & Insulation, Ltd. 35 Booth Ave., Toronto

they want, the nation's oil industry will be remade in a way that will attack the foundations of its vigor and performance. I do not need to remind you that the oil industry, as it is presently constituted, has never failed in any important or lasting way to get its job done in war and peace. That job in war has been one of the most vital essentials of victory and in peace it has provided the fuel and lubricants that put our nation on wheels.

"The suit asks that all gathering and trunk crude-oil pipe lines of these companies be made available to any other producer or refiner, likewise all tankers, barges, marine terminals, and storage facilities. Worst of all, the action seeks to destroy the companies' ability to sell at retail or to retail outlets; we could sell only at refineries or marine terminals. The most radical hater of corporate bigness could hardly ask for more. Independence and integration would be destroyed.

"There is something terribly wrong when something that lends strength to the muscle of our country in times like these is threatened with destruction. It is time to put aside these harassments that weaken us at home, so we can turn all our forces to meet the enemy outside."

T. S. Petersen, president of Standard Oil Co. of California, speaking to the New York Press Club.

Steel Supply

"Our mutual problems at the moment boil down to one undeniable fact: at present there is a shortage of steel. Now government records show that American industries as a whole turned out more goods in 1943 than in any other year. And yet today the steel industry is pouring nearly 12,000,000 more tons of ingots than it did then.

"This means that our nation today is using 100,000,000 tons of steel to produce a smaller quantity of goods than it manufactured out of only 88,000,000 tons. It is just barely possible that some of our customers are following the example of the woman who ordered ten cases of Scotch at a liquor store and explained she wanted to build up her inventory before a lot of greedy people started hoarding.

"Fortunately the steel industry never stopped planning for the future—for its future and for America's future. In the next 27 months our industry will have added 5,000,000 tons to our present capacity. America's steel industry is bigger than those of all other nations on earth put together. The United States Steel Co. alone is pouring more steel today than all the communist nations together are believed to be producing."

Benjamin F. Fairless, president of United States Steel Corp., speaking to the National Association of Purchasing Agents.

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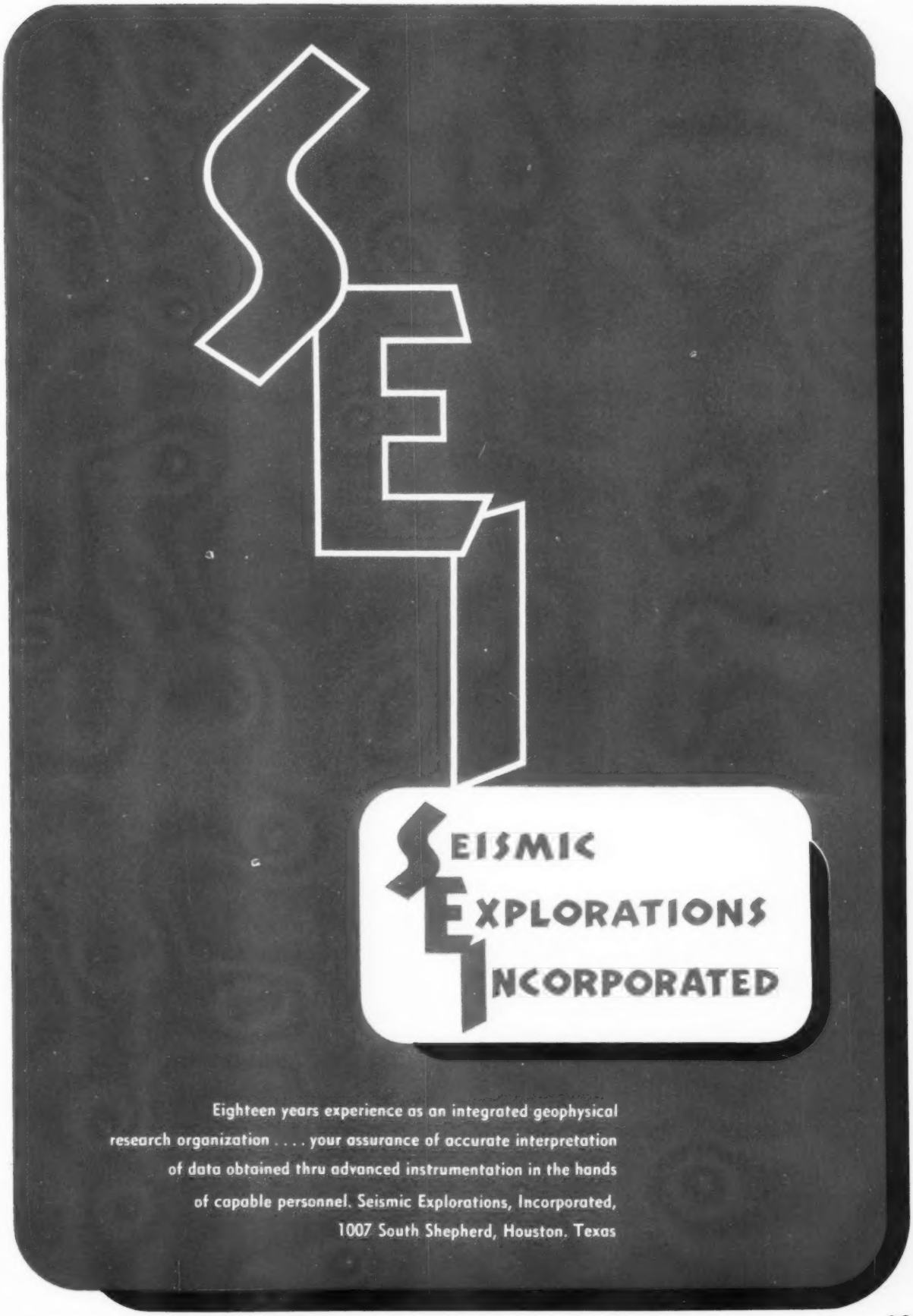

Eighteen years experience as an integrated geophysical research organization . . . . your assurance of accurate interpretation of data obtained thru advanced instrumentation in the hands of capable personnel. Seismic Explorations, Incorporated, 1007 South Shepherd, Houston, Texas

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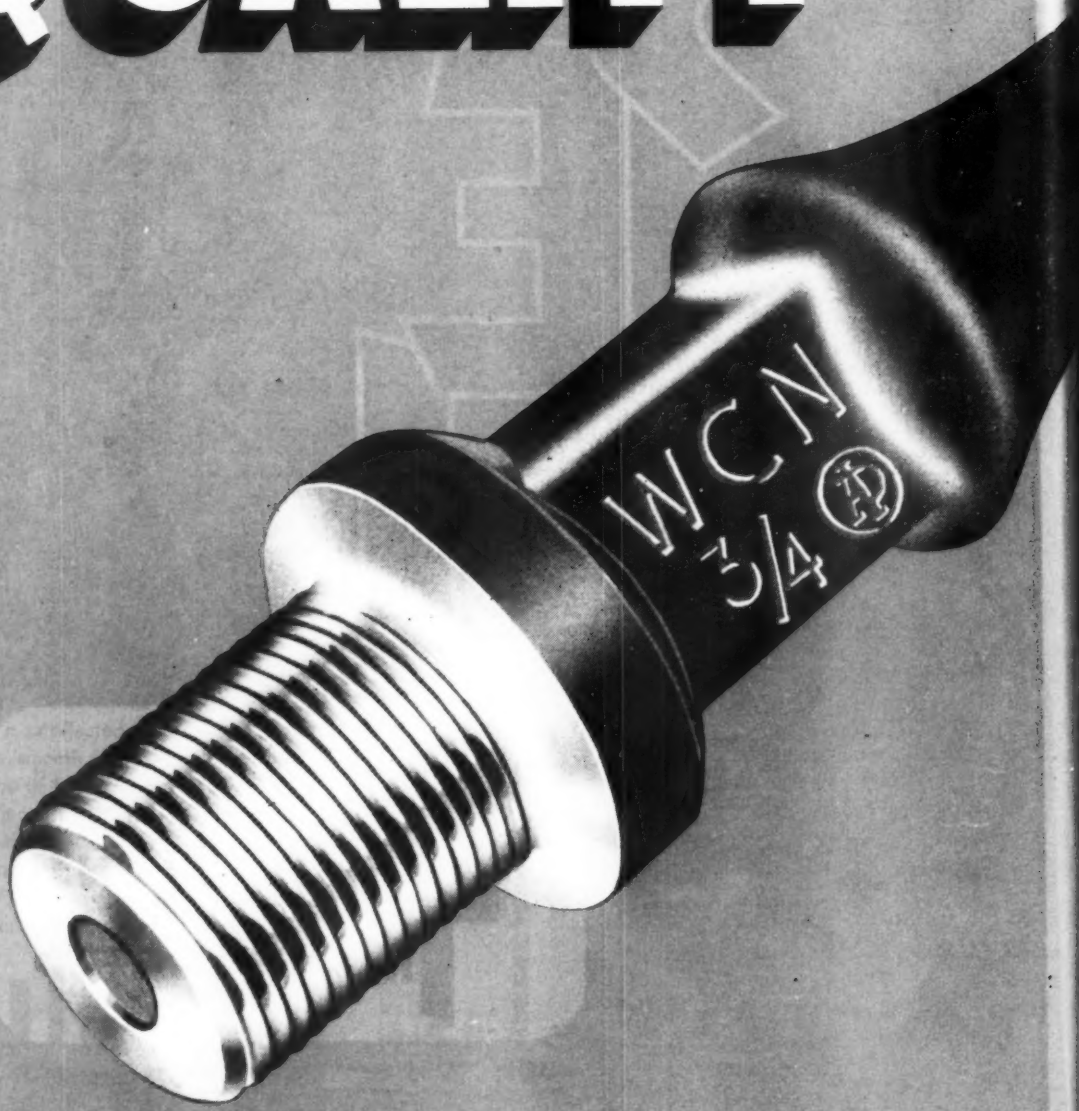
THE SUCKER ROD WITH QUALITY



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JOURNALLY Speaking

Conoco Lore

WE went over to Ponca City the other day to help Continental Oil Co. celebrate its seventy-fifth birthday. The whole thing was refreshingly informal and just a bit nostalgic.

The community band played popular and classical selections just as well as if it had worn uniforms. Three or four thousand shirt-sleeved employes and their kids stood around the field in front of the speakers' platform and exchanged pleasantries with the officials. First names were used more often than last names. Everybody wore a red-and-white baseball cap, giving the function a carnival atmosphere. The mayor made a little speech about how well the company and the city get along together. Then 8,000 employes and families lapped up a western barbecue. It made us wish that all oil companies had their headquarters in small towns instead of in busy and impersonal metropolises of finance.

Continental is holding similar birthday parties throughout its operating territory, which it possessively calls Conocoland, all this month. Employes were asked for suggestions on how to celebrate the occasion. Barbecues, picnics, and carnivals were high on the list of replies, but not at the top. The most popular and apparently entirely spontaneous suggestion was for college scholarships for sons and daughters of employes. This set the officials back a bit. They had been toying with the idea of research fellowships for bright young men who might develop into Conoco scientists, but on second thought they decided it might be better for the company in the long run to help both boys and girls get a general college education. The scholarship plan being established should boost employe loyalty and may be bread cast upon the waters if some of these young men and women come back to Conoco after they get their degrees. The officials were much impressed by this wide interest in education.

We asked a good many questions about Conoco's early history, but got very few answers. With a little embarrassment the officials confessed that they knew practically nothing about the company's early days. They knew it was founded by a bewhiskered entrepreneur named Isaac Blake who set up business in Ogden, Utah, in 1875 to peddle axle grease and coal oil to early settlers and immigrants and who, either through prophetic vision or braggadocio, christened his venture Continental Oil Co. But what happened during the ensuing generation or two is lost in the limbo of western lore. Apparently the company grew so fast that nobody had time to keep records. Conoco officials are trying to correct this deficiency by scouring the archives and prodding the memories of old timers, and eventually they hope to be able to publish a book on the company's history.

This lack of historical records is a curious thing about the oil industry, a characteristic and probably significant thing. Oil men have always looked forward, not backward, been concerned with action rather than paper work. Even many of their early big deals were made without written records, for their word was a contract. Now that the industry has matured to the point where it is celebrating birthdays a good many companies are delving into their origins and writing histories of themselves. Some of them, we understand, are having as much trouble as Conoco.

But Conoco is turning this situation into an asset. Its new slogan is "75 Years—So What?," meaning that the past is a mere nothing and that all eyes are on the future. Conoco's history may be longer and more obscure than most oil companies but its attitude toward it is typical of the entire industry.

We hope that many oil companies will succeed in compiling their histories, not only as a matter of public record and general interest but because of the lessons they may hold for the future. But we also hope that, like Conoco, they will all agree that "what is past is prologue."

—*Henry D. Ralph*

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Pattern for Action

A much faster pace in the mobilization of industry and the shaping of government controls can be expected in the next few weeks, regardless of the state of the fighting in Korea. The administration now has the control law it requested and is perfecting its plans for continuous preparedness and war economy no matter what international situation may develop.

The pattern for control of the oil industry should emerge soon, perhaps at this week's meeting of the National Petroleum Council. At this formative stage it is well to recall the lessons of World War II. There is a close parallel in the situation and in the problem.

Before Pearl Harbor the oil industry and the Secretary of the Interior were avowed enemies on the question of federal control. Within 24 hours after the first bombs dropped, both sides patriotically and realistically buried the hatchet and agreed to work in harness. Secretary Ickes promised to forget his reform ideas for the duration and to seek and take the advice of the industry on war problems. The oil men, on their part, agreed to work with Ickes and to furnish the manpower needed to plan and execute the program. Both parties lived up to their agreement.

Today, to speak quite frankly, some oil men are suspicious of the present Secretary of the Interior. Rightly or wrongly, they consider Oscar Chapman a power-hungry bureaucrat, scheming to impose reforms and federal controls on the industry. For all we know, Chapman may be equally suspicious of oil men and of what he thinks the industry might propose.

But again there is a job to do, and again it can be handled in the same way. The pattern that was shaped the day after Pearl Harbor is sound, fresh, and fully applicable.

Surely Secretary Chapman realizes that he needs the full cooperation of the oil industry to carry out his responsibilities under the Defense Production Act. And the oil industry realizes that it must follow government directives in adjusting to a war economy.

Two things are necessary: Straightforward dealing, and a program for action. The machinery for action already exists in the Oil and Gas Division and the National Petroleum Council, and there will be no reason to scrap it so long as it functions with a spirit of mutual trust.

At this juncture it is entirely in place for the oil industry to come forward with a plan of action for meeting whatever demands the military says are necessary. The industry's physical plant is well prepared. All that is needed is sound and practical direction.

If this is to be a real partnership it is the responsibility of the industry, as the working partner, to take the initiative and keep it. There can be no "vacuum" in mobilization, and if there is no plan ready when needed, the Government will improvise one. Prompt and positive action by the industry's leaders will do much to dispel fear and suspicion all around.

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THIS WEEK

WASHINGTON—Federal agencies turn thumbs down on Harris bill to create top body to set national petroleum policy. . . . ¶New fight brewing in Congress on competitive bidding for oil and gas leases on acquired lands. . . . ¶Agencies which will control production under Defense Production Act now perfecting organizations. . . . Korean developments ease current pressure for controls but new troubles may force adoption of all powers. . . . ¶National Petroleum Council to meet this week to discuss problems of aviation-gasoline production, supply. . . .

PRODUCTION—Texas Railroad Commission to seek oil executives' views on stocks, imports, demands before setting November allowable. . . . ¶Pressure-maintenance program urged for Scurry County, Texas, fields following cutback in allowables. . . . Drop in bottom-hole pressure cited. . . . ¶Ringwood field of Major County, Oklahoma, developing rapidly. . . . One firm asks boundaries be enlarged to permit more drilling. . . . ¶World crude production set new gain in July as result of 126,000-bbl. increase in U. S. . . .

TRENDS—For week ended September 23, crude production was 938,700 bbl. daily or 19.2 per cent greater than in same week in 1949. . . . This is the fifth consecutive week in which the gain over same week last year has exceeded 900,000 bbl. daily. . . . ¶Total production in past 5 weeks has been 33,300,000 bbl. greater than in same weeks in 1949. . . .

INTERNATIONAL—Survey shows U. S. tanker lead has been reduced. . . . ¶American companies operating in Far East deny sales of crude, products to Chinese Reds. . . . ¶Bolivian wildcat on Los Monos structure finds oil. . . . ¶Persia granted another loan from Anglo-Iranian against future royalties. . . . ¶Trucial Coast wildcat on Persian Gulf now below 8,000 ft. . . .

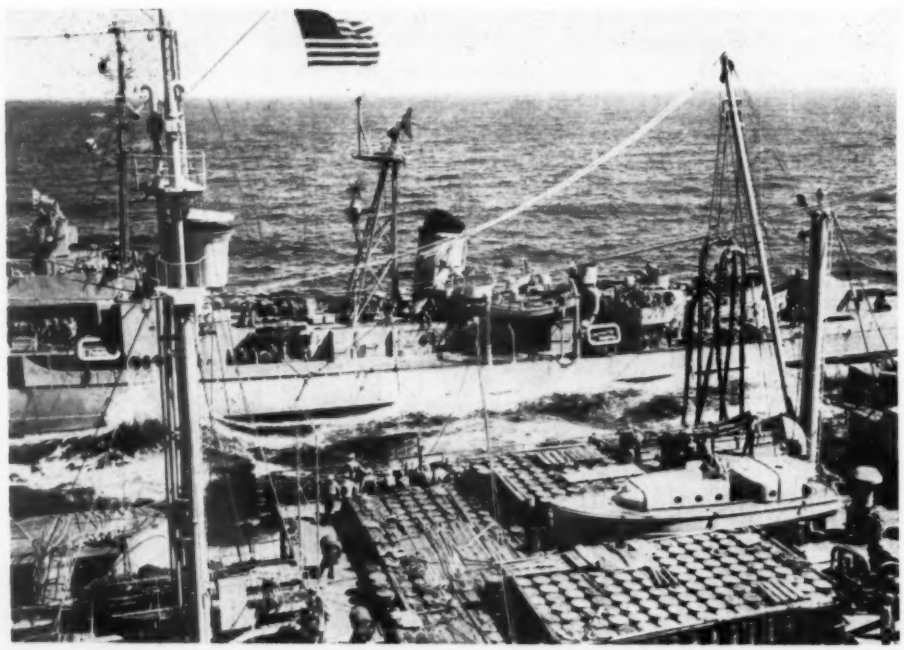
INDUSTRY—Synthetic-rubber program calls for reactivation of plants which will increase present capacity by 100 per cent. . . . Supply of components presents serious problem to industry. . . . ¶Products pipe line planned between Houston area and St. Louis-Chicago region. . . . New firm will operate it as a common carrier. . . . ¶New instruments unveiled at Buffalo meeting of Instrument Society of America. . . .

ACTIVITY—Crude production for week ended September 23 averaged 5,819,825 bbl. daily, down 26,550 bbl. daily from previous week. . . . ¶Total completions increased 34 wells for the week to 934. . . . Wildcat completions decreased 18 wells to 168, still 30 more wells than in same week last year. . . . ¶Rotary rigs operating in United States on September 18 totaled 2,199, down 21 from last week but up 270 from last year. . . .

CANADA—New $18,000,000 refinery to be built at Froomfield, Ont., to process Alberta crude. . . . Supply will be obtained from Interprovincial pipe line now nearing completion. . . . ¶Imperial Oil planning increased tankage to handle storage at eastern terminus of Interprovincial line. . . . ¶First U. S. refinery built to operate on Canadian crude oil will be erected near Superior, Wis. . . .

PIPE LINES—Triangle Pipe Line plans 100-mile, 10-in. extension to its existing system from El Dorado, Ark., to Mississippi River. . . . ¶Pan American Pipe Line begins construction of temporary booster station and auxiliary facilities to increase capacity of its West Texas crude line from 37,500 to 49,500 bbl. daily. . . .

REFINING—Phillips Chemical Co. forms new rubber division as a result of consolidation of two synthetic-rubber plants. . . . ¶Procan, Inc., awarded contract for installation of new cracking unit at Johnson Oil Refinery at Cleveland, Okla. . . . ¶Construction under way on 2,000-bbl. distillation, treating unit at Oil & Chemical Products' refinery near Houston. . . .



WAR WORK.—A United States destroyer refuels on the run from a Navy tanker off Korea in a technique which enabled the armed forces to consume such enormous quantities of petroleum products during World War II. How much and what kinds of petroleum products the military will need this time may be revealed in Washington this week as the National Petroleum Council meets to map the oil industry's war work.

Industry Mobilization

Agencies perfecting organizations which will control production; all DPA powers may be put into effect

Bertram F. Linz

WASHINGTON.—With Congress temporarily off their collective neck, the government agencies administering the Defense Production Act settled down this week to the job of perfecting the organizations through which industry will be mobilized.

Indications that the tide may have turned in Korea took off some of the pressure for extensive controls, but new troubles in Indonesia and threats of trouble in Berlin and other spots along the Russian perimeter were an offsetting factor. After the November elections these may be the basis for putting all of the powers of the production law into effect.

Investigations.—As Congress prepared to leave Washington, two Senate committees readied oil investigations, one of which may have far-reaching influence upon the industry. That is the investigation of all sources of energy other than atomic which will be conducted by the Interior affairs committee, undoubtedly with Chairman Joseph C. O'Mahoney of Wyoming in the driver's seat. This study has as its objective the development of a national fuel policy under which it has been hinted the oil industry may be reined in to permit the coal industry to expand.

The other investigation will go into the adequacy of fuel supplies in New England through a small-business subcommittee headed by Sen. William Benton of Connecticut who sponsored the inquiry. Other members of the subcommimttee will be Senators Russell B. Long of Louisiana, Herbert R. O'Conor of Maryland, Leverett Saltonstall of Massachusetts, and Charles W. Tobey of New Hampshire.

O'Mahoney's committee is required to file its report by next February 3 and Benton is to report 1 month earlier.

Shortages.—The new National Production Authority had another industry meeting September 22, this time with representatives of the chemical industry, to survey the supply situation and see what can be done to step up the output of chemicals in actual or threatened short supply. Two chemicals widely used throughout all industry, including refining—caustic soda and soda ash—are among those in short supply and were included among the items subjected to inventory control in an order issued by NPA.

Secrecy.—Another branch of the Commerce Department, the Census Bureau, was put on a "war footing" last week. It was instructed to revamp its export statistics so as not to show volume or destination of shipments of war materiel, including such products as jet fuel, higher grades of aviation gasoline, and lubricating oils.

Price controls.—At his weekly news conference, President Truman disclosed that he is disturbed by the price situation, is having studies made of it, and that raw materials and commodities that are out of line will be put under selective controls. The President did not say how soon he would act, but made it clear he hopes to avoid the trial-and-error process that marked price control in World War II and the inequities that accompanied it.

Just how badly some prices have gotten out of line is indicated in a report on military procurement. Since last April, that report showed, prices on military needs have increased all along the line in a range from 5 per cent on beef to as much as 240 per cent on radiak training sets. Crude rubber, for instance, is up 161.9 per cent, while fuel tanks are up 39.3, and gasoline drums 10.6 per cent.

Oil prices.—The report stated that since April the price of fuel oil on the West Coast has increased 54.5 per cent from 99 cents to $1.53 per bbl. Gasoline in the same area is up 12.4 per cent from $3.90 to $4.38, and diesel fuel on the Gulf has increased 15.1 per cent from $2.92 to $3.36.

"Despite the existence of some fixed-price contracts," the report stated, "procurement costs have already risen significantly for many important items, with price rises becoming more widespread in recent weeks. The Korean conflict has resulted in a marked increase in requirements for aviation fuel. These increased needs are being met by the use of marginal facilities and practices and additional supplies of 114-145-octane aviation fuel are being purchased today at a cost 30 per cent higher than that of normal supplies contracted for several months ago."

Taxes.—The new tax bill, increasing taxes on both corporations and individuals, finally got through Congress last week, but not until conferees had cut out an amendment sponsored by Sen. Tom Connally of Texas. Under this amendment, amounts received by an assignor for the assignment of oil, gas, and mineral rights, where such rights terminate upon the receipt by the assignee of a fixed or determinable amount of oil or gas, would have been treated as amounts received from the sale or exchange of capital assets.

Leasing Reform

Abuses are suspected in federal practices

WASHINGTON.—A new fight to require competitive bidding for oil and gas leases on "acquired" government lands is shaping up in Congress where Sen. John Williams of Delaware introduced a bill last week along the lines of House legislation which failed to get committee approval earlier this year.

Williams declared he had been told by Director Marion Clawson of the Bureau of Land Management that the Government is losing "millions of dollars" annually by its failure to require competitive bidding for leases on lands originally acquired by other departments for various purposes such as military reservations and national forests.

Agitation for the legislation comes from Mississippi and Louisiana, where the Government holds large areas of potential oil land. Under the law, the state and local authorities receive a part of the federal revenues from use of the acquired lands for oil or timber production or other purposes, and the counties particularly are anxious to secure increased revenues.

The demand for the measure is based on the contention that the Government is granting oil and gas leases at a nominal fee of 25 to 50 cents an acre while private owners are selling leases on adjacent lands for substantial sums. Williams declared that before the Government inaugurated its noncompetitive leasing program in Mississippi it issued leases on 92,212 acres on which it collected more than $2,500,000 in bonuses, but since the ruling in 1947 that leases on unproven structures were not subject to bidding, 94,232 acres have been leased for only $1,680 in filing fees.

Suspicion aroused.—Williams charged that the present law leaves the way open for "fraud, favoritism, and collusion" and the present program cannot be administered "without arousing a lot of suspicion." He suggested a congressional investigation to determine whether any favoritism has been shown.

Williams also attacked the manner in which, he said, the Federal Farm Mortgage Corp. has been selling min-

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eral rights on repossessed farms "to outside speculators" after it had resold the farms. Congress sought to correct this situation in a bill enacted this year to make possible the return of these mineral rights to the farmers, he said, but an investigation should be made of the sales of the corporation and the alleged purchase of mineral rights by federal employes for speculative purposes.

Interior Department records show that 487 oil and gas leases covering 548,539 acres were granted up to June 30, last, and the Government held 2,467,638 acres of oil and gas land patented or certified with minerals reserved to the United States.

No Oil Council

Federal agencies unanimous in disapproving Harris bill to create a top body to set national petroleum policy

WASHINGTON.—Proposals for the creation of a Petroleum Policy Council to develop and coordinate national oil policy, made by Rep. Oren Harris of Arkansas in legislation introduced in the House last year, were unanimously turned down this month by all agencies interested in the subject.

In letters from the Budget Bureau, which speaks for the White House and the Defense Department, the House interstate commerce committee was told that policies should be made by the administration and, in this instance, the National Security Council, rather than by a statutory body. The council suggested by Harris would consist of the Secretary of Interior as chairman and members from the Commerce, State, and Defense departments, and the National Security Resources Board.

Inflexible.—The establishment of such a body, the Budget Bureau said, "would be inadvisable because it would set aside the tested procedures already in operation and would eliminate the administrative flexibility which is necessary for a well-balanced over-all consideration of petroleum problems."

The bureau, and in a separate letter the Interior Department, held that the present government-industry partnership, including the National Petroleum Council and the military advisory board, is working better than any formalized arrangement that would be set up under the Harris bill.

This partnership, the bureau said, "has brought about a close relationship not only between the various agencies of the Government concerned with petroleum policy, but also between the Government and various other interested groups, including the petroleum industry, the state conservation agencies, and the Interstate Oil Compact Commission. It is broad enough to permit comprehensive consideration of the economic, military, and international aspects of policy and flexible enough to allow, within the framework of coordinated activity, appropriate shifts of emphasis to meet changing conditions at home and abroad."

Partnership preferred.—Similar views were expressed by the Interior Department in a report which also said the Harris proposal "probably would lose for us most, if not all, that has been gained in the patriotic partnership between the Government and the oil and gas industries."

Submitting the department's views, Asst. Sec. C. Girard Davidson noted the sensitive relationship between world oil demand and supply "and the political, commercial, and financial considerations which influence or determine the flow of oil in international trade" which is so subject to change that "it can be only the general policy objective which can be expected to have continuity of purpose."

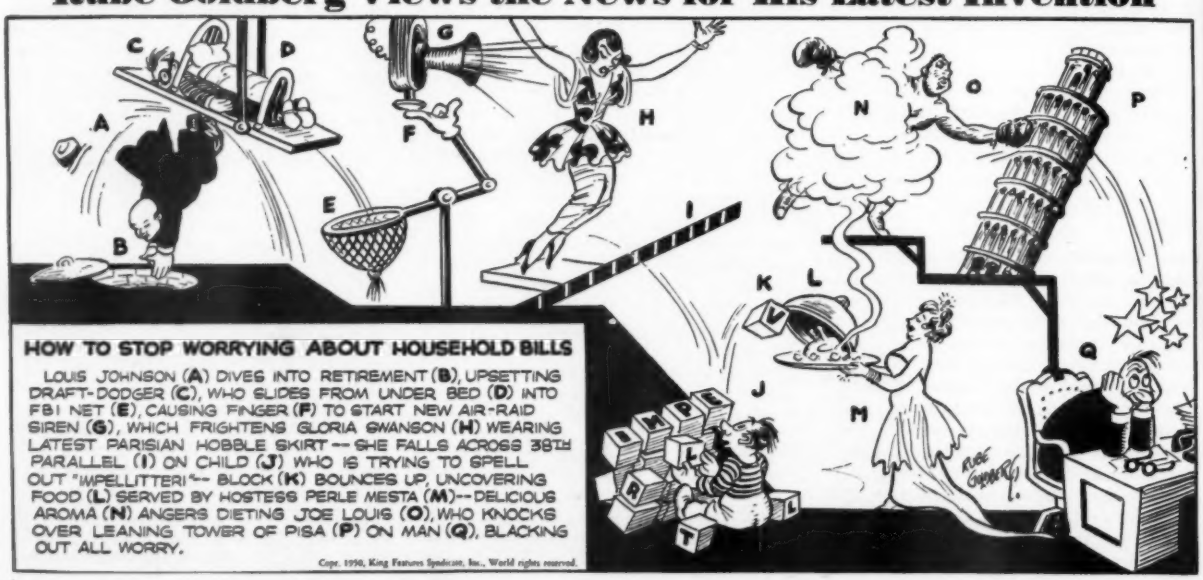
"The actions taken in their pursuit may contradict themselves within the briefest span of time," Davidson said.

No boss wanted.—The suggestion that policy should be made through the National Security Council was offered by the Munitions Board, speaking for the Defense Department, in evident opposition to creation of a body in which the Secretary of the Interior would be dominant.

The department, the board said, does not favor those provisions of the bill which would designate the representative of the Interior Department as chairman of the council and "which would impose an obligation upon the participating agencies to carry out the majority decisions of the council."

The Department of Commerce and Federal Trade Commission also opposed the bill. The latter expressed the fear that a proposed industry advisory panel would give the oil industry an "inside track" in the formulation of national policy.

Rube Goldberg Views the News for His Latest Invention



HOW TO STOP WORRYING ABOUT HOUSEHOLD BILLS

LOUIS JOHNSON (A) DIVES INTO RETIREMENT (B), UPSETTING DRAFT-DODGER (C), WHO SLIDES FROM UNDER BED (D) INTO FBI NET (E), CAUSING FINGER (F) TO START NEW AIR-RAID SIREN (G), WHICH FRIGHTENS GLORIA SWANSON (H) WEARING LATEST PARISIAN HOBBLE SKIRT — SHE FALLS ACROSS 38TH PARALLEL (I) ON CHILD (J) WHO IS TRYING TO SPELL OUT "IMPELLITTERI" — BLOCK (K) BOUNCES UP, UNCOVERING FOOD (L) SERVED BY HOSTESS PERLE MESTA (M) — DELICIOUS AROMA (N) ANGERS DIETING JOE LOUIS (O), WHO KNOCKS OVER LEANING TOWER OF PISA (P) ON MAN (Q), BLACKING OUT ALL WORRY.

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WATCHING WASHINGTON

Bertram F. Linz

Suspicion

Congress is determined to keep a close watch on the rearmament program, and committees on both sides of the Capitol are holding frequent hearings at which administration officials are sharply questioned regarding the steps taken to insure the national defense.

This surveillance already has paid off in disclosure by the Senate group of a lag in the stockpiling program, particularly in rubber, and lack of foresight in continuing to dispose of "surplus" industrial facilities even after the invasion of South Korea.

On the House side, one of the committees interesting itself in the war program is that on interstate commerce, which in executive sessions has been digging into the supply of aviation gasoline, synthetic rubber, and other oil-based products. Reportedly, the committee has been advised of the deficiencies in aviation gasoline and synthetic-rubber components and the steps that are planned to deal with them. These matters also were under consideration last week in a meeting of the Military Petroleum Advisory Board, and the committee will be informed of any decisions which may be reached.

The interstate commerce committee kept in close touch with the military and other agencies on oil matters throughout World War II with such good results that it determined to continue the policy so long as the international situation remains disturbed. The Senate committee is the successor to the war investigating committee whose disclosures of scandals in the ship program and extravagances such as the Canol project catapulted Chairman Harry Truman into the vice presidency.

More Suspicion

The U. S. Chamber of Commerce announced last week that its natural resources committee had submitted a report to the chamber board of directors holding that if national safety should require the application of arbitrary industry controls, Congress and not some government agency should decide their extent.

The announcement itself was not the story but, rather, the meeting attended by oil, natural gas, coal, power, metal, and timber men at which the main theme was suspicion of Interior Department administration of the authority given it over those commodities by the Defense Production Act.

The men who talked in committee, and most of them did, were frankly fearful that there is a lot more in the cards than has shown up on the surface and definitely suspicious that the administration is only waiting until the congressional elections are out of the way to start slapping down on industry.

Imposition of controls before they are really needed, it was felt, would simply disorganize the natural-resources industries, which are in good shape to meet all defense needs provided they are given adequate manpower, supplies, and machinery and freedom from strikes. But these industries, it was warned, can expand production only to the extent that those things are available.

Still More Suspicion

The Senate committee on Interior affairs is expected to tell Congress next January whether it should enact a law authorizing the Interior Department to impose end-use controls on oil.

That, in essence, will be the result of a study of all fuels in which the committee will shortly engage for the purpose of writing a national fuels policy.

A resolution authorizing the investigation was opposed by Sen. Elmer Thomas of Oklahoma, but noting that he was badly outnumbered the senator last week withdrew his motion to reconsider the measure which was passed by the Senate August 15.

Thomas, however, laid before the Senate a memorandum on which he based his objection to the inquiry, stressing that Interior Secretary Oscar L. Chapman and other witnesses before the committee during its hearings on the resolution "more or less stoutly" defended the private competitive enterprise system but nevertheless left the impression their proposals would control the end use of fuels and perhaps allocate certain parts of the market to particular fuels.

The memorandum noted that in response to a question by Chairman Joseph C. O'Mahoney of Wyoming, Chapman declared he has neither the law nor the inclination to assign any part of the energy market to a particular kind of fuel "at the present moment," but admitted that such a law would have to be considered in any study of the fuel problem.

NPC Meeting

Avgas situation to be main topic of group

WASHINGTON.—A meeting of the National Petroleum Council is scheduled for this week to discuss the aviation-gasoline situation and enable members of the industry to get a fill-in on the defense-production organization to be set up by the Interior Department.

The meeting was called for September 28 at the request of the department, on a week's notice, following meetings of the Military Petroleum Advisory Board at which the aviation-gasoline supply situation was a major subject of discussion between MPAB members and officials of the Munitions board.

Aside from the avgas situation and Interior's new control organization, the only subject expected to come up at the NPC meeting is steel, on which the committee which has been studying the problem since the July meeting is expected to have a report. An interim report may be submitted by the committee studying transportation, but that as well as other matters on which council advice has been asked is still in the works.

The MPAB meeting developed the areas in which action must be taken to provide an additional supply of components for aviation gasoline, both for the remainder of this year and for 1951. The situation is aggravated by the fact that many avgas components also will be required for the all-out synthetic-rubber production called for by President Truman. Alkylates and benzine are among the items of serious concern, the latter also being a major component of military high explosives.

The NPC meeting is scheduled to discuss both the short-term and long-term outlook, the latter being viewed in Washington as requiring at least three steps—shifting of components used by refineries, new construction of plants, and the building of additional tank cars, particularly pressure cars.

Since the industry itself cannot develop any concerted program for developing additional production without running the danger of antitrust action, the Government will have to coordinate its activities and secure a clearance from the Department of Justice, provided for under the Defense Production Act, for any program that is agreed upon.

Coordination will be the keynote of Interior's defense-production activities rather than control, directed first toward avgas and steel, which are considered the major current problems. J. R. Parten, president of Woodley Petroleum Co. who was Petroleum Administrator for War Director of Transportation in World War II, is expected to help blueprint the oil-control agency as a consultant.

XUM

Production Quandary

Texas commission cuts crude output and asks executives' views on stocks, imports, and demand to guide next move

AUSTIN. — Executives of 15 major oil companies have been asked by the Texas Railroad Commission to testify on adequate stock levels of crude and refined products at the next state-wide proration hearing October 19. This action was taken at the September hearing which also resulted in a reduction of 125,162 bbl. daily in October allowables—the first reduction in 6 months.

Commissioner Ernest O. Thompson said he thought "a new look" should be taken at plans for imports of crude, demand outlook, and the question of adequate working inventories of crude oil and refined products.

Oil-company executives appeared before the commission last May on a similar mission. At that time the consensus was that the nation should have 245,000,000 bbl. of crude aboveground at all times. The new call came after U. S. Bureau of Mines figures showed current stocks to be about 10,000,000 bbl. below this figure.

During the discussion on adequate working stocks, Commission Chairman W. J. Murray, Jr., pointed out that Texas allowables had risen from 53,000,000 bbl. to 85,000,000 bbl. during the last 6 months. This has resulted in an increase of 10,000,000 bbl. of Texas crude in storage, the reverse of the national picture.

Companies with executives on the commission's call for the October 19 hearing include: The Texas Co., Gulf Oil Corp., Standard Oil Co. (N. J.), Sun Oil Co., Socony-Vacuum Oil Co., Inc., Atlantic Refining Co., Standard Oil Co. (Ind.), Shell Oil Co., Sinclair Oil & Gas Co., Continental Oil Co., Phillips Petroleum Co., Humble Oil & Refining Co., Standard Oil Co. of California, Magnolia Petroleum Co., and Cities Service Oil Co.

Production cut. — Transportation bottlenecks in West Texas and rapid declines in bottom-hole pressures in three Canyon reef lime pools were largely responsible for the sharp reduction in October allowables.

The cut of 125,162 bbl. daily marked a halt in a 6-month upward trend in production which began last April. The October allowable, set at 2,761,296 bbl. daily, is 431,296 bbl. per day above the Bureau of Mines demand forecast of 2,330,000 bbl. for the coming month. Purchasers' crude-oil nominations totaled 2,658,751 bbl. daily, up 10,135 bbl. from September.

The commission estimate of natural-gasoline and distillate production of 281,379 bbl. daily raises the combined flow of hydrocarbons from Texas to 3,042,675 bbl. daily during October. Texas crude-oil production for the week ended September 16 was 2,886,458 bbl. daily, an all-time high.

A portion of the October cutback will be offset by new wells completed and placed in production during the remainder of September. So far this month additional well completions have raised the total Texas allowable 26,000 bbl. daily.

October's 31 days, against September's 30 days, results in an automatic reduction in the allowable created by continuation of the present schedule of 21 producing days for the East Texas field and 22 days for most of the remaining Texas fields.

Scurry situation.—Nearly one-half of the allowable reduction was made in six Canyon reef lime pools: Reinecke, Sharon Ridge, Diamond M, Kelly-Snyder, Cogdell, and Salt Creek. Allowables in these fields, situated on the east side of the Permian basin were cut 61,870 bbl. daily, effective September 20 instead of October 1, effective date for the rest of the state. Cause of the reduction was ascribed by the commission to abnormal decline in pressures in three of these fields and lack of sufficient pipe-line capacity. Bottom-hole pressures in three of the fields had been dropping off as much as 3 psi. daily in some sectors. During the period from April 1 to September 1, Sharon Ridge lost 318 psi., Kelly-Snyder 407 psi., and Diamond M 509 psi. These declines "may be too excessive," Commissioner Olin Culberson said. Bottom-hole pressure surveys in all the reef fields will be completed by October 15.

The reduction was accomplished by lowering the top allowable in each of the fields, except Reinecke, from 220 to 160 bbl. daily. Further application of shut-down days to the basic allowable lowers the per-well figure to an average calendar-day rate of 117 bbl. Reinecke had been operating under a top allowable of 350 bbl. per well.

Pipe-line problem.—A factor leading to the reduction in allowables was the lack of pipe-line capacity from high-rate producing fields in the Scurry-Borden-Kent areas in Commision District 8. Ira M. Walker, Houston, president of Pan American Pipe Line Co., which serves the areas through an 80-mile, 10-in. line, told the commission that producers in the area had tendered 50,000 bbl. of crude daily to be transported by Pan American during October. Present capacity of the line is 37,500 bbl. daily, but Pan American plans to increase the capacity to 49,500 bbl. daily by the end of September through the use of temporary booster facilities. Material shortages may prevent the installation of permanent booster facilities before January 1 which would raise capacity of the line to 55,000 bbl. daily.

Six companies serve Scurry County, where most of the reef production is located, with gathering lines. On September 1, they were gathering approximately 191,000 bbl. daily. Ultimate capacity of the lines is figured at around 240,000 bbl. daily.

HOUSTON.—Pipe-line capacity for the Scurry area of West Texas will be increased more than 100,000 bbl. daily by the spring of 1951, when Basin Pipe Line System increases throughput of its Colorado City-to-Wichita Falls segment from 250,000 to 350,000 bbl. daily.

R. B. McLaughlin, president of Texas Pipe Line Co., which operates the system, said capacity of the Wichita Falls-Cushing, Okla., portion of the line will be stepped up from 270,000 to 385,000 bbl. daily. Four additional booster stations will be built and existing stations modified. Additional tankage will be erected at Colorado City station which currently moves 115,000 bbl. daily from the Scurry area.

In the long-range picture, the 100,000-bbl. planned expansion of the Basin Pipe Line System offers the best hope of relief for West Texas. Another possible source of relief is the recently announced proposal for a crude line from the area to California. However, this project is many months or years from realization.

East Texas status.—Operators in East Texas field voiced objection against any further increases for that area,

TEXAS ALLOWABLES

Average calendar day allowable for Texas fields for October 1, 1950, with net decrease under allowable for week ended September 16.

District—	Oct. 1 allowable (bbl.)	Net decrease under Sept. (bbl.)
1 (Southwest)	33,912	413
2 (Southwest)	157,163	4,721
3 (Gulf Coast)	478,319	11,071
4 (Southwest)	241,098	10,181
5 (East Central)	45,636	1,350
6 (East Texas)	300,541	9,468
6 (Outside East Texas)	108,441	2,828
7B (West Central)	95,464	1,444
7C (West Central)	73,304	1,432
8 (West Texas)	906,701	79,512
9 (North Texas)	204,601	2,764
10 (Panhandle)	116,116	8
Total	2,761,296	125,162

calling attention to a drop of 3.87 psi. in pressure during the month of August. On September 1 the weighted average bottom-hole pressure was reported at 1,024.56 psi. H. P. Nichols, Tyler, asked for only 20 producing days for that field, while Malcolm Lake, also of Tyler, requested 20 days in a 30-day month and 21 in a 31-day month. In reply, Commissioner Culberson stated that the MER for East Texas was 21 days and would not be exceeded except in an extreme emergency.

Pressure in Scurry

Drop in well pressures spurs program for cooperative pressure-maintenance project for Canyon reef fields

THE action of the Texas Railroad Commission last week in citing a decline in bottom-hole pressure as one reason for reducing the allowable production of crude oil in Scurry and adjacent counties is expected to stimulate interest in proposals to institute pressure maintenance in the Canyon reef fields of that area.

Preliminary planning has already been started by a number of Scurry County producers who earlier formed the Scurry County Area Engineering Committee. This committee has been making a series of pressure studies of wells in the area and is reporting its findings to the Railroad Commission.

Representatives of the same companies, many of them also members of the engineering committee, met recently in Tulsa and recommended the formation of study groups to work on various phases of the problem with a view to ultimate adoption of pressure-maintenance projects in the principal reef fields. At present the preliminary studies are being outlined by the engineering committee which is headed by W. L. Horner, chief production engineer of Sunray Oil Corp.

All Scurry County operators will be invited to attend another meeting early in October at which it is proposed to launch the program with the creation of committees or study groups. Initially the studies will be confined to pressure-maintenance problems common to Von Roeder, Sharon Ridge, Diamond M, and Kelly-Snyder fields. Studies will be divided into problems of unitization, engineering predictions of results of pressure maintenance, water supply, and economics of pressure maintenance.

Unitization.—The preliminary conference agreed that before major expenditures could be approved for pressure maintenance the fields must be unitized or a cooperative operation put into effect.

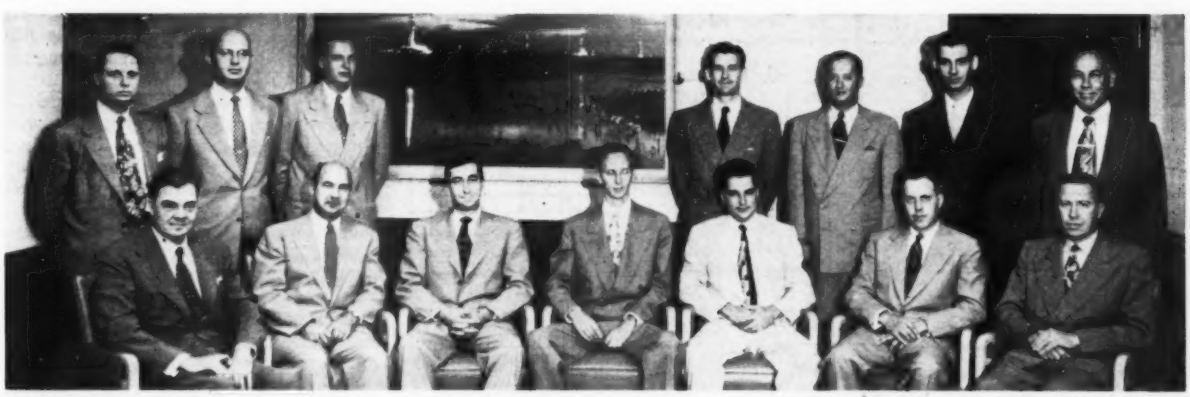
Under present Texas law the Railroad Commission could not order pressure maintenance nor allocate production among tracts except on a showing by the operators that this is necessary to prevent waste. It would therefore be up to the operators to agree voluntarily on a formula for computing the percentage of equity for each tract and to obtain consent of the royalty owners.

Engineering.—One group is proposed to make calculations and predictions of results obtainable by various types and degrees of pressure maintenance. This will include such topics as reef geology, core analysis, log interpretations, field pressure tests, reservoir continuity and intercommunication, irregularities of permeability, displacement efficiencies for water or gas, and possibilities for gas injection. It is anticipated that much of the preliminary work on these subjects will be done in the laboratories of the various operators.

Water supply.—One big difficulty may prove to be an adequate supply of water for flooding operations. Salt water or surface water could be used, but some present at the preliminary conference felt that the search may have to be extended far beyond the limits of the fields and that the services of the hydrologist may be required.

Economics.—A fourth committee is suggested to work primarily on the economics of pressure maintenance, largely for the purpose of promoting the project and securing the cooperation of operators and royalty owners. This group would calculate costs and results of various methods of pressure maintenance and attempt to estimate the waste which might be prevented and possible increases in ultimate recovery.

Price.—A possible further spur to interest in pressure maintenance is the action last week of Magnolia Petroleum Co. in raising the posted prices for crude oil in Scurry County. Effective September 21 the company posted $2.65 per barrel for crude of 40° gravity and above. The former price was $2.58 per barrel. The new gravity scale for Scurry crude is the same which previously applied to crude from fields lying somewhat to the east of Scurry County. This increase will partially offset the lower allowables and may help in providing a financial incentive for the pressure-maintenance program.



Petroleum engineers participating in the Scurry County, Texas, pressure-maintenance conference in Tulsa recently. Front row, left to right: D. V. Carter, Magnolia Petroleum Co., Dallas; J. H. Sidwell, Hiawatha Oil & Refining Co., San Antonio; Frank Richardson, Lion Oil Co., El Dorado, Ark.; F. H. Callaway, Stanolind Oil & Gas Co., Tulsa; James R. Buckley, Sun Oil Co., Dallas; R. E. Clark, Shell Oil Co., Midland, Tex.; and Burton Atkinson, Tide Water Associated Oil Co., Houston. Back row, left to right: Joseph A. Ross, Jr., Standard Oil Co. of Texas, Houston; A. S. Trube, Tide Water Associated Oil Co., Houston; Aaron Cawley, Honolulu Oil Corp., Midland, Tex.; W. L. Horner, Sunray Oil Corp., Tulsa; W. F. Burke, Lone Star Producing Co., Dallas; S. F. Bird, Amerada Petroleum Corp., Tulsa; and E. B. Armstrong, Honolulu Oil Corp., Midland, Tex. Cliff W. Trice, Hunt Oil Co., Dallas, participated, but is not in the photograph.

XUM

Expanding Ringwood

Extension of field limits asked as Manning formation proves productive over wide area; pipe line enlarged

Philip C. Ingalls

ENID Okla.—The pace of expansion in the fast-spreading Ringwood pool, 20 miles west of here in Major County, has led Superior Oil Co. of California to petition the Oklahoma Corporation Commission for another enlargement of the legal boundaries of this field, one of the most active areas in the state.

Already there are 115 wells producing from the Manning formation in Ringwood, all flowing, 35 wells drilling, and 18 locations staked with some of them now rigging. Pipe-line outlets are expanding so that at present only a few outpost wells are handled by tank truck.

New area.—The proposed expansion of the field includes over 28,000 acres, which would bring total area to nearly 40,000 acres. The commission is requested to apply the current 40-acre spacing rule to the additional area. A hearing on this petition has been set for October 5.

The new area will take in Superior 1 Fuller, the only Manning well south of the Cimarron River, and other stepouts to the west which are also producing from the Manning. All of the wells in the Ringwood pool are producing from the Manning zone, which geological data indicate will be productive over an area more or less corresponding to the new outline requested by Superior.

The big Ringwood pool is not yet defined in any direction by dry holes, for none has been drilled in the immediate area. The limits to the south and west are still anyone's guess. The northeastern limits of Manning production, however, may be in sight. In this section of the field, where Superior's discovery well was drilled, the Manning shows definite evidence of thinning toward the pinchout and the wells have higher than average gas-oil ratios.

Also, regional stratigraphic studies indicate that the Manning pinchout should be found just to the north of Mazda Oil Corp. 1 Hays, north offset to the pool's discovery well and northernmost well in the field. This well was completed without trouble and, though open only 3 hours a day because of high gas-oil ratio, has been flowing 17 to 20 bbl. daily since completion on October 15, 1947. Superior's discovery well, completed December 1945, is also still flowing.

Pipe line.—Champlin Refining Co. is currently running all of the field's production through a 4-in. pipe line completed in February of this year, which runs from the southern part of the field to the company's refinery at Enid, about 20 miles to the east. Prior to the construction of this pipe line Champlin was trucking all of the oil produced in the field, and is now trucking the oil produced by the stepouts to the south and west.

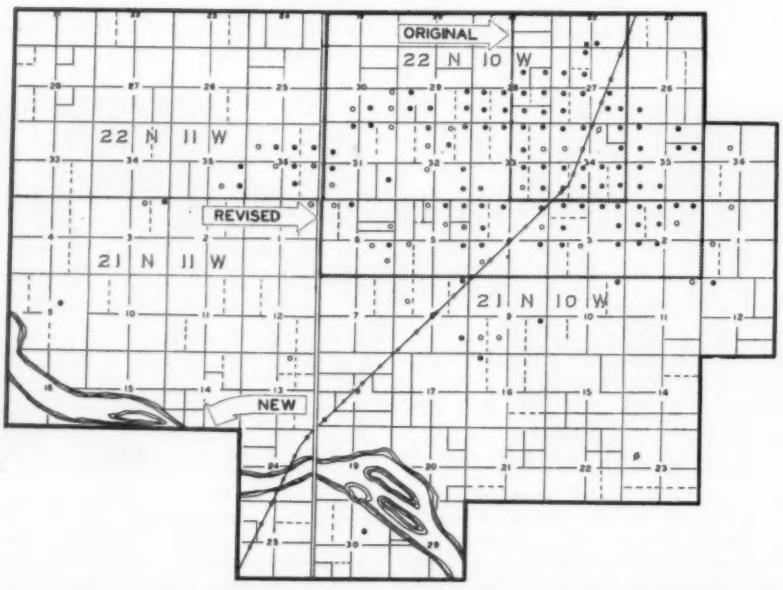
Harry E. Lillibridge, consulting geologist of Enid, who with his wife and partner, also a geologist, was behind the extensive holdings of Mazda Oil Corp. in Ringwood field.

Current pipe-line runs are between 6,000 and 6,500 bbl. daily. The existing 4-in. line could handle up to 8,000 bbl. daily by utilizing the electric booster pump, located about halfway to Enid, all of the time instead of just two-thirds of the time as at present. The portable diesel pumps at the field station are now operating at 930-985 lb. pressure. A 12-point vacuum is maintained on the gathering system.

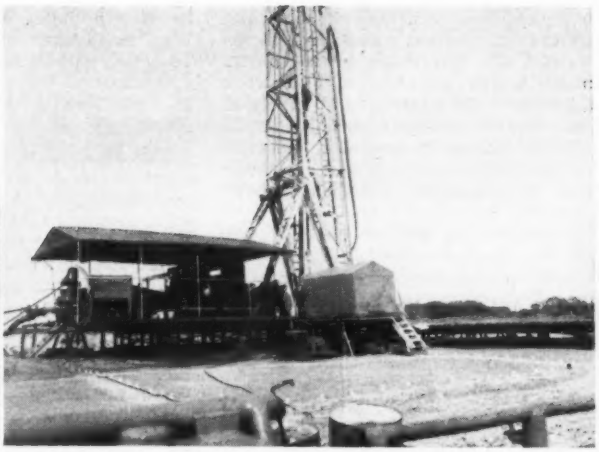
Champlin's pump station has a 50,000-bbl. tank and two 1,000-bbl. tanks. Firewalls have been thrown up for a 10,000-bbl. tank for which there is steel on the ground. These tanks are not used for storage, but for gaging and in the event of an emergency. It is to Champlin's advantage to get this oil which is close to its Enid refinery so operators never had to wait for an outlet. This pipe line-refiner operator has authorized laying whatever capacity lines that may be needed. The company probably will soon loop some of the existing 4-in. line with a 6-in. line.

Only a shortage of pipe will prevent the continuation of the Ringwood boom. There are already a few indications of the effect of this shortage, and more is anticipated.

Acidizing.—It has been found that the Manning, in spite of appearing more adaptable to selective acidizing, does not respond to the selective treatment as well as to volume treatment. It has also been found that a treatment of around 20,000 gal. has proven most satisfactory for the average



Map of Ringwood field showing original boundaries, first extension, and proposed new addition requested of Oklahoma Corporation Commission.



RINGWOOD SCENES.—The equipment needed to acidize a well in the Manning formation is shown in the picture on the left, taken last week during treatment of the Mazda 1 Harris, 8-21n-1w. Here the perforated interval 6,794-6,922 ft. was acidized with 20,000 gal. and after returning oil load and acid water flowed 262 bbl. of oil per day on a 15/64-in. choke. At the right is a rig of Harbar Drilling Co. at Mazda 1 Taylor, 1-21n-11w, drilling at 6,138 ft. last week.

wells. Superior 1 Campbell was recently treated with 50,000 gal., but such large volumes have not been found to be necessary in most wells.

Wells have been completed in the Manning with initial production tests as high as 120 bbl. per hour. Coronado Oil Co. 1 Hutchins, NE NW NE 35-22n-10w, completed last week, filled all available storage at this rate. Mazda 1 Farnsworth, NE NW NW 2-21n-10w, initialed 1,200 bbl. in 24 hours. The current daily allowable at Ringwood is 155 bbl. daily, and about one-half of the wells are making that allowable.

Other sands.—Though the Maramec formation of the Mississippian has been found productive in several wells it has not been a common practice to test the formation because the competitive drilling is in the Manning. Likewise, the lower Manning, so called for want of a better name, has been found productive in several wells, but there have been no completions in this horizon. Gas and oil shows have also been noted in the upper Layton, Oswego, Prue, and Hunton.

Out of the 115 producing wells in the Ringwood pool, Mazda Oil Corp. has 41 producers with 9 more drilling or ready for completion, Superior has 27 producers, and Kewanee Oil Co. 19 producers, which were recently purchased from C. Andrade, III, of Dallas for $100,000 per well.

TECHNOLOGY

New Instruments

Continuous measurements and central monitoring of many oil-industry processes are shown at I. S. A. conference

BUFFALO.—The growing part which instruments play in precise measurement and control of industrial processes and modern research projects was stressed at the fifth national instrument conference and exhibit sponsored here last week by the Instrument Society of America.

A feature of the meeting was the annual exhibit of instruments and devices for measurement, inspection, testing, and control. Representing products and projects of 146 manufacturers and five government agencies, this display was believed to be the most widely diversified of its kind ever assembled.

The full week of technical sessions was preceded by a 3-day instrument-maintenance clinic, at which instrument men and apprentices were given the opportunity of exchange of information on trouble shooting and repair. The clinic was organized jointly by the I.S.A. maintenance and operation committee and the Niagara frontier section educational committee.

Monitoring.—The subject of instrumentation for production processes drew attention in several sessions. In discussing process monitoring systems, E. J. Grace, Jr., of Sun Oil Co., outlined a method for measuring at a central point the various temperatures, pressures, levels, and flow rates which, while not critical to an operation, are of use to the operator in determining the optimum operating condition of such equipment items as heat exchangers, pumps, and compressors.

Several monitoring systems were described, each comprising three separate circuits; the selecting circuit, the measuring or controlling circuit and the checking circuit. Grace cited the new 28,000-bbl. Houdriflow catalytic cracking unit at Toledo as an example of the trend toward larger, more complex process operations which require the application of monitoring systems.

Spectrometers.—On the timely subject of use of spectrometers in process control, representatives of Consolidated Engineering Co., Pasadena, presented a report on a mass spectrometer for monitoring continuous processes. The increased accuracy of the mass spectrometer has justified the expense of adapting it to certain processes in the chemical and refining industries, according to the authors.

Such an example is the application of the instrument to the sensitive detection of ethane in the bottoms stream from the deethanizer column. Initial tests of the mass spectrometer to such applications were facilitated by the cooperation of the research and development division of Socony-Vacuum Oil Co., Inc., at Paulsboro and by Esso Laboratories, Baton Rouge.

Oil-field use.—A new instrument application to oil-production problems was described by P. O. Engelder of Oil Well Water Locating Co., Long Beach, in a paper describing continu-

XUM

ous electronic recording of the water content of oil-field emulsions. He described the Enniscope as an instrument which provides a correlation between water content in an oil emulsion and the differences between dielectric constants and loss tangents of the highly polar water molecules and the nonpolar petroleum molecules.

These effects are revealed in passing an emulsion through a capacitor which is energized by a source of high-frequency energy. Water salinity does not affect accuracy as long as oil forms the continuous phase of the emulsion. Salinity must be considered, however, when measuring an oil-in-water emulsion, and corrections may be applied.

Dutch development.—A mass flow meter designed to measure pulsating flow was described by D. Brand and L. A. Ginsel of Royal Dutch-Shell Laboratory, Delft, Holland. Tested on oils of varying viscosities, the newly developed meter satisfactorily measured mass flow of the fluids under pulsating conditions. The instrument comprises a housing in which runs an electrically driven cylindrical rotor.

The flow, entering the housing at right angles to the rotor axis, passes on either side of the rotor through gaps between rotor and housing, and leaves the meter on the opposite side. The differential pressure between the two gaps is proportional to the mass flow, and a properly damped differential-pressure meter connected to the two gaps can therefore be used for the measurement of pulsating flow.

In addition to the technical sessions, two specialized forums were conducted on gas flow through capillary tubes and the "bread-board model" electrical computer. Discussion chairman for the latter forum was Jean Warner of Kendall Oil & Refining Co., Bradford, Pa.

CANADA

New Refinery

Canadian firm to build $18,000,000 plant at Froomfield, Ont., to process 20,000 bbl. of Alberta crude oil daily

TORONTO. — A new refinery to process Alberta crude will be built by Canadian Oil Refineries, subsidiary of Canadian Oil Companies, Ltd., Toronto. The $18,000,000 plant will be located at Froomfield, Ont., a Great Lakes port on the St. Clair River near Sarnia.

Construction of the refinery, which will have a capacity of 20,000-bbl. per day, will start soon, according to W. Harold Rea, president, and initial operation is scheduled for April 1952. Stone & Webster Engineering Corp. has been named project manager.

The new plant will receive annually 5,000,000 bbl. of crude from Alberta via the line of Interprovincial Pipe Line Co., Ltd., in which Canadian Oil Companies owns a $900,000 interest, and by tankers. It will be a complete refinery and will incorporate modern catalytic cracking, reforming, and polymerization to produce an estimated 105,000,000 gal. of gasoline annually, plus diesel, stove, furnace, and heavy fuel oils and L.P.G.

Facilities for the manufacture of aviation gasoline may be included if military demand requires. The plant will also serve the national-security program in providing butylenes and other light petroleum fractions for synthetic-rubber manufacture at the federally owned Polymer Corp. plant located 2 miles distant in Sarnia. Refinery fuel gas will be made available to local industry.

Plant site.—The new plant will be erected on a 200-acre site, part of which has been used by the company as a tanker terminal and tank farm handling imported United States crude for the company's refinery at Petrolia, 16 miles inland. On completion of the Interprovincial line next spring, the 4,000-bbl. Petrolia plant will switch to Alberta crude. The company estimates that initial operation of the Froomfield refinery on domestic crude will save Canada $17,500,000 annually in United States funds.

No contracts have been closed with licensors of the catalytic processes proposed for the new refinery. Engineers of Canadian Oil and Stone & Webster are now studying the available processes for catalytic cracking, catalytic reforming, and polymerization, with an eye to performance, cost, and adaptation to their requirements. Final decisions will probably not be reached before late this year.

The crude unit at the new plant will combine atmospheric and vacuum distillation. It will be capable of charging 20,000 bbl. of crude daily during the peak spring and summer seasons. In winter, when tanker shipments of crude from Interprovincial's Superior, Wis., terminal will be cut off, the plant will operate at reduced rate from storage. In addition to the present 365,000 bbl. of storage at the Froomfield terminal, the company will erect 900,000 bbl. for crude and products. The new refinery will also have available 435,000 bbl. in storage at Petrolia which will be used for crude and products during the closed navigation season.

The company's tanker, the "John Irwin," will handle product delivery to marine terminals at Hamilton, Toronto, Fort William, and Parry Sound during the open season, and tank-car shipments will be substituted in winter. Docking facilities at Froomfield provide space for a simultaneous berthing of both the product tanker and a crude tanker.

Other installations. — Other refinery installations will include a complete steam-generating plant, a product transfer and loading pump house, ethyl-blending facilities, pressure storage for L.P.G. and an office building.

Canadian Oil Companies was organized in 1904 by merging several small companies operating on western Ontario crude. The Petrolia refinery, which was built in 1901, produced kerosine, axle grease, factory lubricants, and paint and varnish. In 1908, when additional capital was required to expand gasoline production, company control was sold to National Refining Co. of Cleveland, which operated the Canadian subsidiary for 30 years. A Canadian group purchased National's interest in 1938 and today 97.3 per cent of the company's shareholders are Canadians who own 99.43 per cent of the stock.

The Canadian Oil refinery is the latest and largest of four complete new refineries to be announced for Canada this year. Three new plants incorporating catalytic cracking and other modern facilities are now under construction in the prairie provinces. They include: British American Oil Co., Ltd., 5,500 bbl. per day, Edmonton; Imperial Oil, Ltd., 10,000 bbl. per day, Winnipeg; and McColl-Frontenac Oil Co., Ltd., 5,500 bbl. per day, Edmonton. The largest refinery in Canada, the plant of Imperial Oil, Ltd., at Sarnia, is located within a few miles of the proposed new Canadian Oil refinery.

Storage Project Planned

SARNIA, Ont.—Imperial Oil, Ltd., has announced plans to erect 3,000,000 bbl. of additional storage at its refinery here as a part of the over-all plan for the use of Alberta crude oil.

The 20 new tanks to be built will store crude oil during the winter months when navigation is closed on the Great Lakes. The crude will be brought through the new 1,126-mile Interprovincial line to Superior, Wis., and during the summer moved by two new tankers to Ontario refineries. Other projects in the system include new terminal facilities at Sarnia.

About 3 miles of 20-in. line will be laid to move the crude to the tank farm, and more than a mile of 16-in. auxiliary lines will be required in the storage area. The pipe will be made of Canadian and British steel. Work on the new tankage is to start this fall. Contract has been let to Horton Steel Co. of Canada, and Toronto Iron Works.

Pipe-Line Feat

Interprovincial job said to be fastest ever done

TORONTO.—Despite such obstacles as a national railway strike, the worst floods in the history of southern Manitoba, and frequent delays due to bad weather, contractors on the 775-mile Canadian section of Interprovincial Pipe Line Co., Ltd.'s, Edmonton-Great Lakes project have carried out what is considered to be the fastest major pipe-line construction ever completed.

Interprovincial announced last week that apart from some backfilling and right-of-way cleanup work, actual construction of the Canadian section was within a few days of completion. The Canadian part of the project consists of 439 miles of 20-in. to Regina, Sask., with 16-in. the remaining distance to Gretna, Man.

When contractors started the job in Canada, they faced a time table of 150 days in which to complete the work. The job has been done well within this deadline, and Interprovincial said that while longer and larger lines have been built, none has been on such a short time schedule.

U. S. section.—Crews on the other 322-mile section of the line in the United States extending to the head of the Great Lakes at Superior, Wis., have several more weeks of work before completion. Completion of the Canadian section before the target date of September 30 has allowed Interprovincial to plan operation of that part of the system between Edmonton and Regina on October 4. At that time, temporary pumping units at Edmonton will start filling and testing this section and later will begin moving crude to Regina refineries. Work on the main station at Edmonton is continuing. First deliveries of crude at Regina probably will be made about November 1.

Interprovincial officials said that movement of the first crude into the Edmonton-Regina section on October 4 will be marked by an official ceremony, details of which will be announced later. The buildup of Redwater-field crude in storage at Edmonton started August 25 and is continuing in order to provide the 840,000 bbl. needed to fill this section.

Opening of the initial section of the line will mark the first time that Alberta oil has been moved eastward by pipe line. The entire system contemplates storage of crude at Superior for movement by tanker to Ontario refineries during the time navigation is open. This full operation of the system will begin in the spring of next year. The company pointed out that apart from crude to fill the line and storage at both ends, no appreciable increase in the output of Alberta oil will result until tanker shipments start next spring.

U. S. Plant

Wisconsin refinery to process Alberta crude

THE first United States refinery built to operate on Canadian crude oil will be erected in the Superior, Wis., area, and will receive its supply from the terminus of Lakehead Pipe Line Co.'s line (the United States portion of Interprovincial Pipe Line Co., Ltd.'s line from Edmonton to the Great Lakes).

W. C. Berry, Tulsa industrialist, has purchased a 3,500-bbl. refinery from Carter Oil Co. at Cut Bank, Mont., and will dismantle the facilities and reerect them near Superior.

Berry said he plans to increase capacity of the skimming and thermal cracking facilities to approximately 5,000 bbl. daily, processing Alberta crude. The Cut Bank plant is the last of four such installations acquired by Carter Oil when it entered the Northwest territory.

Dismantling operations will begin on October 1, and it is anticipated that reerection will be completed and the plant in full operation at its new site by February 1, 1951, Berry said.

Interprovincial Pipe Line announced that it had no plans to sell Canadian crude to United States refiners when its crude-oil line was first projected. The line is a common carrier, however, and will ship Alberta crude for any purchaser.

The Cut Bank region is now supplied by Carter's Billings, Mont., refinery. O. C. Schorp, Carter president, said in Tulsa that due to a lack of demand for products turned out at Cut Bank, together with a declining crude supply, it was a feasible step to sell the facilities.

INDUSTRY AFFAIRS

Products Line

Common carrier planned from Gulf to Chicago

NEW YORK.—The first independently owned and operated common-carrier pipe line for petroleum products will be constructed between the Houston-Beaumont region of the Texas Gulf Coast, and the St. Louis-Chicago consuming areas, according to an announcement made here this week.

The line will be built and operated by United States Pipe Line Co., a newly formed Delaware corporation which has as its principal officers E. Holley Poe and Paul Ryan, who are responsible for present development plans. The system will handle gasoline, distillates, and L.P.G.

Adequate finances, satisfactory steel supplies, and experienced management by nationally recognized executives in the products-pipe-line industry have been arranged, according to the principals, and early construction is planned "with particular consideration for the accelerated urgency and broad flexibility demanded of this system as an essential element of the integrated national-defense program."

The company will be independently owned and operated with no shipper-owner affiliations and no investments by oil-company shippers. Reservations for space will be contracted, assuring each oil company adequate transportation irrespective of competitive tenders.

Receives support.—Under development for several years, this project has now received sufficient support from Gulf Coast refiners to assure its construction. Estimates of product volumes which refiners propose to move in the new system are now being firmed up by a survey of actual requirements by refiners. Until such figures are available, the actual size and capacity of the new common carrier cannot be determined.

The new line, originating from feeders in the Houston-Beaumont-Port Arthur refining area, will touch Shreveport, El Dorado, and Helena, Ark.; Memphis, Cairo, Ill., St. Louis, and Chicago, providing terminal facilities at those and other points. Extensions eastward from the St. Louis area will connect with new and existing product pipe lines in the Midwest

The new system is expected to replace much of the inland water traffic which currently is estimated to reach 200,000 bbl. per day of petroleum products moving northward on the Mississippi system. While the rate structure has not been announced, it is estimated that the line may shave about 25 cents per barrel from the cost of barging products from Gulf Coast refineries to points as near as Memphis, with substantially greater savings in comparison with rail shipments.

XUM

Synthetic-Rubber Step Up

Production of vital material ordered increased 100 per cent by RFC, but supply of components presents problem

Bertram F. Linz

WASHINGTON.—Production of synthetic rubber has been ordered stepped up by nearly 100 per cent since the Red invasion of South Korea in June, and the Reconstruction Finance Corp. still has further capacity which also will be reactivated, but problems of supply of components will have to be overcome before full production can be developed.

The Interior Department already has advised refiners to adjust their yields to provide more of the materials necessary for synthetic rubber and aviation gasoline, and currently is making a detailed study of the whole supply situation. Deficiencies are known to exist in butylenes, benzene, and soda ash; butanes are in satisfactory supply. Since some of the ingredients for synthetic rubber also are ingredients for aviation gasoline, plastics, or both, the problem of supply must be considered from several angles.

Benzene offers a particular problem, since it is produced as a byproduct in the manufacture of coke for steel mills. The steel industry is already operating at capacity, so that increased output of benzene from this source cannot be substantial; it can be produced from petroleum, but at higher cost, or by hydrogenation of coal, and consideration now being given to government construction of additional facilities under the new Defense Production Act will have to include a decision between coal and oil as basic material.

The present projected synthetic-rubber program will require something on the order of one-half of the total styrene capacity of the country, but the Office of Rubber Reserve, the RFC subsidiary in charge of rubber, believes there will be sufficient capacity left for the production of styrene for plastics and other uses.

The recall to service of the alcohol-butadiene plants built during World War II will also raise alcohol-supply problems. At full operation, these plants would require well over two-thirds of the industrial alcohol presently available. Molasses is the cheapest source of this alcohol, but there will be none available this year; the alternative is grain alcohol and the Government holds large quantities of potatoes and grains acquired under the farm-price support program. But potatoes are considered an uneconomic source of alcohol and the grain stocks are good products which the Government expects to sell for food. There are, however, some deteriorated grains in the hands of farmers and a lot of wet corn is expected this fall. After that, it is expected the needed alcohol will be diverted from the distilling industry.

Fifty-one plants.—During the last war the Government built 51 synthetic-rubber plants—15 copolymer (GR-S), 2 butyl, 1 neoprene, 3 alcohol butadiene, 14 petroleum butadiene, 5 styrene, and 11 miscellaneous. Today it holds 28 plants, plus 5 which it had declared surplus and turned over for disposition but which were "frozen" recently; only 1 of the 5 is usable, however.

The copolymer plants were designed for the production of 600,000 long tons of GR-S a year, of which 345,000 tons capacity was in operation at the time of the Korean invasion, including 183,000 tons capacity for cold rubber. The butyl plants have a combined capacity of 68,000 tons, of which 42,667 tons was operating. Active butadiene plants have a capacity of 241,200 short tons a year, equivalent to approximately 300,000 long tons of GR-S, with stand-by capacity, most of which now is being reactivated, slightly greater—248,000 short tons, equivalent to about 310,000 long tons of GR-S. The styrene plant has a design capacity of 25,000 short tons a year.

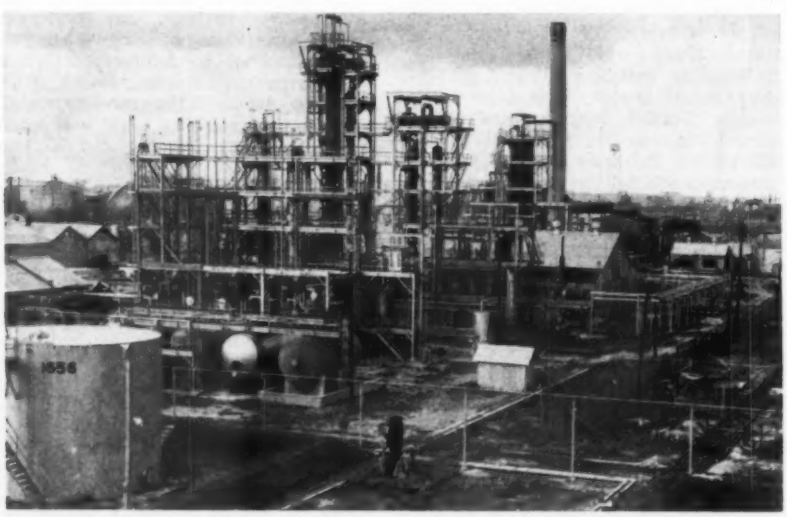
During the first half of this year production of synthetic rubber totaled slightly more than 145,000 tons, of which 143,000 tons was government-made GR-S. An additional 11,600 tons was imported from Canada, which has been increasing shipments to the United States steadily since 1947, and Canadian capacity is seen as aiding our situation materially.

The decision to expand the production of synthetic rubber was reached less than a month after the Communists invaded South Korea, and was recommended by the rubber industry as early as July 7. The industry recommended that GR-S production be upped immediately from 30,000 to 40,000 tons a month and to 50,000 tons monthly by next January 1, with an increase in butyl production of about 1,000 tons a month.

In several orders for reactivation of idle facilities, however, the Office of Rubber Reserve has gone even further and now has scheduled an output of 760,000 tons of GR-S and 75,000 tons of butyl a year.

Some want more.—Despite this great increase in output, there are many in Congress who would have the Government go still further. Sen. Lyndon B. Johnson of Texas, chairman of the preparedness subcommittee of the Senate armed services committee, recommended to the National Security Resources Board last month that new programs including definite ultimate capacities, locations, and improved design, be developed "right up to the blue-print stage" without delay.

While no great difficulties are anticipated in reactivating facilities which have been held in stand-by condition, only one of the five plants which the Government was attempting to dispose of last June is considered usable. That is the copolymer



Typical of the synthetic-rubber facilities being put back into operation by the Government is this plant at Baton Rouge, La., for making butadiene from petroleum petroleum. It was operated by Standard Oil Co. of Louisiana, now part of Esso Standard Oil Co.

plant at Akron, Ohio, operated during the war by Goodyear Synthetic Rubber* Corp. The plant, in which the Government invested $6,575,000 and which it was attempting to sell in June for $1,375,000, has a capacity of 30,000 long tons, and is now being reactivated.

SYNTHETIC-RUBBER PLANTS OPERATING OR TO BE REACTIVATED

Copolymer (GR-S)

Operator and location—	Design capacity (annual) long tons
Firestone Tire & Rubber Co., Akron, Ohio	30,000
Firestone Tire & Rubber Co., Lake Charles, La.	60,000
Goodyear Synthetic Rubber Corp., Akron, Ohio	30,000
B. F. Goodrich Co., Port Neches, Tex.	60,000
Goodyear Synthetic Rubber Corp., Houston, Tex.	60,000
Phillips Chemical Co., Borger, Tex.	45,000
United States Rubber Co., Naugatuck, Conn.	30,000
Copolymer Corp.,* Baton Rouge, La.	30,000
General Tire & Rubber Co., Baytown, Tex.	30,000
United States Rubber Co., Port Neches, Tex.	60,000
Minnesota Mining & Manufacturing Co. and Pacific Rubber Co. (two plants), Los Angeles, Calif.	60,000
Kentucky Synthetic Rubber Corp.,† Louisville, Ky.	30,000
Total	525,000
Butyl	
Esso Standard Oil Co., Baton Rouge, La.	25,000
Humble Oil & Refining Co., Baytown, Tex.	30,000
Total	55,000
Butadiene	
Cities Service Refining Corp., Lake Charles, La.	55,000
Humble Oil & Refining Co., Baytown, Tex.	30,000
Neches Butane Products Co.,‡ Port Neches, Tex.	100,000
Phillips Petroleum Co., Borger, Tex.	56,200
Carbide & Carbon Chemicals Corp., Louisville, Ky.§	40,000
Koppers Co., Inc., Kobuta, Pa.¶	40,000
Copolymer Corp.,* Baton Rouge, La.	15,000
Shell Chemical Corp., Torrance, Calif.	25,000
Sinclair Rubber, Inc., Houston, Tex.	50,000
Standard Oil Co. of California, El Segundo, Calif.	18,000
Total	429,000
Styrene	
Dow Chemical Co., Los Angeles, Calif.	25,000
Miscellaneous	
Akron University, Akron, Ohio‖	.....
United States Rubber Co., Naugatuck, Conn.**	1,800

*Copolymer Corp. is owned jointly by Armstrong Rubber Co., Dayton Rubber Manufacturing Co., Gates Rubber Co., Armstrong Rubber Manufacturing Co., Mansfield Tire & Rubber Co., Sears, Roebuck & Co. (affiliated with Armstrong Tire & Rubber Co.), Lee Rubber & Tire Corp., and Inland Rubber Corp.

†Kentucky Synthetic Rubber Corp. was formed by American Hard Rubber Co., Boston Woven Hose & Rubber Co., Brown Rubber Co., Goodall Rubber Co., Hewitt-Robins, Inc., Dryden, Rubber Division of Sheller Manufacturing Corp., Simplex Wire & Cable Co., Sponge Rubber Products Co., Thiokol Corp., and Raybestos-Manhattan, Inc.

‡Neches Butane Products Co. is jointly owned by Atlantic Refining Co., Gulf Oil Corp., Pure Oil Corp., Socony-Vacuum Oil Co., Inc., and The Texas Co.

§Two of three units.

¶Two of four units.

‖Evaluation and pilot-plant laboratory.

**Dodecyl mercaptan plant operating on "Lorol" feedstock.

The other plants are a $7,368,000, 15,000-short ton petroleum butadiene plant at Toledo formerly operated by Sun Oil Co., which is described as "no good"; a $12,557,000, 30,000-short ton petroleum butadiene plant at Los Angeles, operated by Southern California Gas Co., which is a commingled, reconverted gas plant and will be held for its equipment; a $3,246,000, 72,000-short ton calcium carbide plant at Ashtabula, Ohio, operated by National Carbide Corp., from which the neoprene plant was sold and the whole taken out of the rubber program; and a $545,000, 5,000-short ton catalyst plant at Baton Rouge operated by Esso Standard Oil Co., which is obsolete.

Rubber Reserve is bringing back into operation four of seven 20,000-ton units in the alcohol-butadiene plants at Louisville and Kobuta, Pa.; a second unit, about 13,000 tons, in the three-unit butyl plant at Baton Rouge; and 60,000 tons of the 75,000-ton capacity of the copolymer plants at Los Angeles, in addition to a number of complete plants.

All activated.—The President, however, has ordered that all facilities be reactivated, including the three alcohol-butadiene units with a total capacity of about 100,000 tons; maybe 15,000 tons of copolymer capacity at Los Angeles; and a 90,000-ton copolymer plant at Institute, W. Va., built at a cost of $17,124,000 and operated formerly by United States Rubber Corp., which were not covered by the original program.

Since the end of the last war, 18 of the original 51 plants which comprised the Government's rubber program have been sold. Eleven of them were sold without any restrictions, but seven were sold subject to certain stipulations as to use or subject to an obligation to supply government requirements up to a certain level. The RFC, therefore, can make a call upon the output of these plants, and in some cases, might recall them, but present indications are that it will enter into contracts for production, and the first such arrangement may be entered into with B. F. Goodrich Co. for 15,000 to 18,000 tons of GR-S from a unit in the $10,921,000, 60,000-ton copolymer plant at Louisville which the company purchased in January 1947 for approximately $4,187,000.

The other plants in which the Government retained some rights are the $1,985,000, 6,800-ton petroleum-butadiene plant at Baton Rouge bought by Esso Standard Oil Co. in January 1949 for approximately $325,000; the $19,273,000 styrene plant at Texas City, capacity 50,000 short tons, bought by Monsanto Chemical Co. in October 1946 for $9,908,000; the $12,242,000, 37,500-ton styrene plant at Kobuta, Pa., bought by Koppers Co., Inc., in October 1946 for $3,265,000; a third styrene plant of 50,000 tons capacity in which the Government invested $17,828,000 at Velasco, Tex., purchased by Dow Chemical Co. in February 1947 for $14,518,000; a $4,356,000, 12,000-ton furfural plant at Memphis bought by Q. O. Chemical Co., in November 1946 for $1,362,000; and a $37,658,000, 60,000-ton neoprene plant at Louisville bought by E. I. du Pont de Nemours & Co., Inc., in January 1949 for $13,300,000.

As so far developed, the Government's program from plants now operating or to be reactivated is as shown in the accompanying table.

***CONGESTED TRAFFIC.**—The 16-in. pipe line being built to supply crude oil to the Cities Service refinery at East Chicago, Ind., from the terminal at Wilmington, Ill., passes through one of the most congested underground areas in the nation 30 miles south of Chicago's loop. At this spot, near Chicago Heights, the line goes under four other pipe lines within a space of 150 ft.*

XUM

World Production

U. S. gain of 126,000 bbl. daily enables output to set new record in July; minor change noted in other areas

Dahl M. Duff

WORLD production of crude oil continued its upward trend in July, reaching another new record as a result of the further gain in output in the United States.

During July, production in most of the principal foreign producing countries showed little change from the high levels reported in June. In the United States, however, output increased approximately 126,000 bbl. daily over the preceding month.

Total world production, which went above the 10,000,000-bbl. daily mark for the first time in June, approximated 10,574,000 bbl. daily in July. This was an increase of slightly less than 1 per cent over the June daily average of 10,470,900 bbl.

Behind these all-time record figures being reported by the industry world wide is an unprecedented demand for petroleum products both in the United States and abroad. Direct military requirements are a factor but thus far a relatively slight one. General prosperity and industrial activity, including shipping, manufacturing, and construction, are considered to be the main reasons for the all-time high level in petroleum production.

Although the world production total, including the United States, gained some 103,000 bbl. daily from June to July, the Middle East and the Western Hemisphere exclusive of the United States actually showed small decreases. Venezuela was down a fraction of a per cent from the all-time high in June; in the Middle East, Saudi Arabia and Iraq reported production slightly below the previous month.

Because of these decreases, foreign production, excluding estimated Russia and Eastern Europe, declined a relatively small 23,000 bbl. daily below June. The July daily average was 4,206,400 bbl. daily.

Up 18.7 per cent.—The 5,504,000 bbl. daily produced in the United States in July represented an increase of 17 per cent over July 1949. Total world production in July was 18.7 per cent above the year-earlier level. Foreign production, excluding Russia and Eastern Europe, was 22.8 per cent over July of last year. The Middle East area showed a gain of slightly more than 35 per cent in its output from July 1949 to July of this year.

Venezuela's July production of 1,533,300 bbl. daily was about 39,000 bbl. daily under the crude output in June. Production by weeks in Venezuela during July was: Week ended July 3, 1,576,303 bbl. daily; July 10, 1,536,725 bbl. daily; July 17, 1,520,599; July 24, 1,531,168 bbl. daily; and July 31, 1,535,460 bbl. daily.

The country's crude-oil production set a new record during the week

WORLD CRUDE-OIL PRODUCTION
(Thousands of barrels daily)

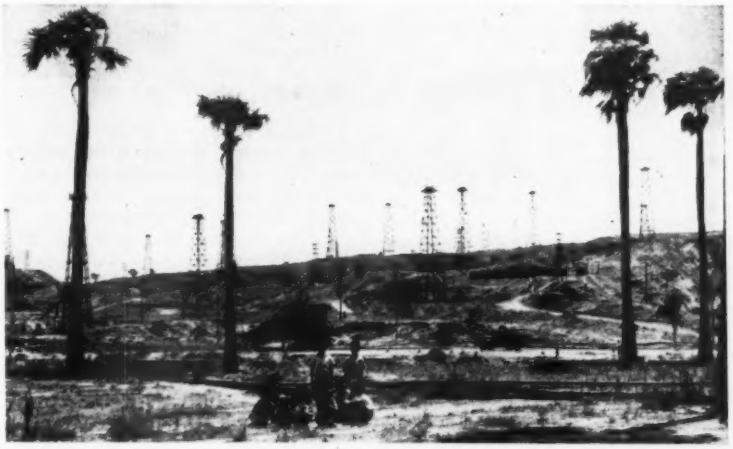
Country—	July 1950	June 1950	July 1949
Western Hemisphere:			
Argentina	68.0	66.0	61.3
Bolivia	1.5	1.5	2.3
Brazil	0.5	0.3	0.1
Canada	80.0	71.7	57.3
Chile	1.5	1.5	.....
Colombia	97.8	89.3	84.4
Cuba	0.3	0.3	0.6
Ecuador	7.1	7.1	7.5
Mexico	195.2	191.7	168.3
Peru	40.0	40.2	40.9
Trinidad	56.5	56.6	56.5
Venezuela	1,533.3	1,572.0	1,317.7
Total	2,081.7	2,098.2	1,796.9
Europe and Africa:			
France	3.2	2.9	1.3
French Morocco	0.8	0.8	0.4
Germany	21.9	21.5	17.3
Italy	0.2	0.2	0.2
Netherlands	14.4	14.3	11.3
Egypt	39.9	44.4	43.9
United Kingdom	0.9	0.9	0.9
Total	81.3	85.0	75.3
Middle East:			
Bahrein	30.3	30.6	30.1
Iran	691.2	687.0	567.3
Iraq	128.5	138.1	109.9
Kuwait	363.7	358.5	230.4
Qatar	35.2	33.7	.....
Saudi Arabia	558.6	562.6	401.0
Turkey	0.8	0.8	0.4
Total	1,808.3	1,811.5	1,339.1
Other Asia:			
British Borneo	82.0	82.0	69.5
Burma	1.5	1.5	0.5
China	1.5	1.5	1.5
India	5.2	5.2	5.3
Indonesia	130.0	130.0	125.7
Japan	6.0	5.8	3.8
New Guinea	5.0	5.0	5.6
Pakistan	3.9	3.9	1.8
Total	235.1	234.9	213.7
Total, foreign less Russia and E. Europe	4,206.4	4,229.6	3,425.0
Estimated Russia and Eastern Europe:			
Austria	25.0	25.0	18.0
Romania	85.0	85.0	90.0
Russia	730.0	730.0	650.0
Other E. Europe	23.6	23.6	19.0
Total	863.6	863.6	777.0
Total, foreign	5,070.0	5,093.2	4,202.0
United States	5,504.0	5,377.7	4,703.8
Total world	10,574.0	10,470.9	8,905.8

Figures are from reliable reports in the industry or from official government sources. Data for Russia and Eastern Europe are based on competent estimates; no authentic information is available on production in these areas.

PRODUCTION IN VENEZUELA BY COMPANIES
(Barrels daily)

Company—	July	First 7 months 1950
Creole	678,854	652,142
Shell	476,973	442,856
Mene Grande	218,710	186,095
Socony-Vacuum	38,477	33,002
Texas	28,382	25,516
Atlantic	20,512	22,360
Mercedes	19,051	18,040
Sinclair	12,798	13,355
Pantepec	12,983	12,628
Phillips	7,660	7,990
Richmond	17,892	9,894
British Controlled Oilfields	955	1,018
Guasare	17	88
Total	1,533,264	1,424,984

Figures from the Venezuelan Ministerio de Fomento reflecting production by concession or lease area and thus different from operated production or net plus purchased royalty.



BURMESE FIELD.—Increasing pacification in Burma in recent months has raised hopes for an improved outlook for oil operations in that country. Here is a recent view of a part of Chauk field, about 300 miles from Rangoon in Central Burma. It was brought in by Burmah Oil Co., Ltd., in 1901. A small topping plant in the field handles the present small Burma production of 1,000-1,500 bbl. daily. Increased production awaits more settled conditions which would allow reconstruction of facilities destroyed in the war. About 40 miles down the Irrawaddy River from Chauk, B.O.C. operates another field, Yenangyaung (Burmese for "oil creek"). This field has an even longer oil history, being the home of a Corporation of Twinzayos, or hereditary oil-well owners, who for centuries have enjoyed exclusive rights to dig in certain reserves in the field.

ended September 11, with an average of 1,593,000 bbl. daily. Previous weekly high was in the week ended June 26, with 1,586,866 bbl. daily.

Venezuela's output has been at or near record levels for the last 4 months as a result of heavy demand, both in the United States and abroad, for petroleum products and particularly heavy fuel oil.

The Ministerio de Fomento of the Venezuelan Government recently issued a production summary showing output the first 6 months of this year. This gave daily average production for the first half of 1950 as 1,406,439 bbl. daily. Indications are that Venezuela's production in August gained over the July daily average.

Colombia's oil production set a new all-time record in July. Including condensate and natural gasoline, total output was 100,300 bbl. daily. Production of crude alone was 97,800 bbl. daily against 89,300 bbl. daily in June. The higher production, principally from Shell's Casabe field, was made possible by the additional capacity recently installed on the Andean National pipe line.

Total production in the Yondo concession (Casabe field) rose from 695,937 bbl. in June to 986,622 bbl. in July. July production in other concessions in Colombia was: De Mares, 1,089,095 bbl.; Barco, 789,624 bbl.; Cantagallo, 41,608 bbl.; Dificil 88,652 bbl.; and Velasquez, 30,350 bbl.

Canadian production in July was up about 8,000 bbl. daily. This increase reflected preparations for the opening this fall of the Edmonton-Regina pipe line. Further major gains in output in Canada are anticipated next spring when the complete line is placed in operation to Superior, Wis.

Western Europe.—In western Europe, western Germany's production registered another slight increase to establish a new postwar record at 21,900 bbl. daily. The total of 96,136 metric tons included 45,171 tons from Emsland, 41,151 tons in Hanover, and 9,295 tons in the Hamburg-Schleswig-Holstein area. In recent months, the small production in metropolitan France has made an approximate three-fold gain as a result of development of the new Pyrenees field at Lacq. July output in France was reported at about 3,200 bbl. daily. Crude production in the Netherlands in July was 63,787 tons (equal to 14,400 bbl. daily), only slightly under the record total of 63,944 tons in May. The domestic Dutch output now meets roughly 30 per cent of the oil demand in the country.

Egypt's production in July dropped off somewhat. Of the approximately 40,000 bbl. daily produced during the month, Sudr accounted for 8,240 bbl. daily, Asl 9,870 bbl. daily, Ras Gharib 21,340 bbl. daily, and Hurgahda 740 bbl. daily.

Production as a whole in the Persian Gulf area during July was down about 3,000 bbl. daily under the 1,811,500 bbl. daily produced in June. Output in Saudi Arabia fell back slightly from the record level of June and averaged 558,573 bbl. daily in July. Iraq's production was off about 10,000 bbl. daily.

Against this, Kuwait reached another new record in July with 363,700 bbl. daily. This was about 5,000 bbl. daily over June. Kuwait's July output represented an increase of 58 per cent over July of a year ago. Iran reported a relatively small increase in output, totaling 691,200 bbl. daily compared to 687,000 bbl. daily in July. Iran's July production was nearly 22 per cent over that of July 1949.

While there is no accurate information whatever on oil production in Russia and its satellites, a recent statement by a Communist Party leader in Romania indicated that oil production in that country is still considerably below the 1938 output of about 132,000 bbl. daily. The Romanian official gave no absolute figures on petroleum production, asserting, however, that the total in 1950 would be almost 50 per cent greater than in 1949. Since the 1949 figures are not known, the statement is virtually meaningless. Nevertheless, if the statement is accepted, 1950 output will be 100,000 bbl. daily or more even considering last year's production at the somewhat low estimate of 65,000 to 70,000 bbl. daily.

TREND OVER THE LAST YEAR

	Western Hemisphere less U. S.	Middle East	Total foreign less Russia and E. Europe
1949—			
August	1,859.9	1,323.9	3,473.1
September	1,931.8	1,351.5	3,574.9
October	1,921.6	1,428.6	3,645.0
November	1,925.9	1,472.7	3,683.0
December	1,929.3	1,489.6	3,711.0
1950—			
January	1,946.5	1,491.4	3,733.4
February	1,820.6	1,566.6	3,689.4
March	1,900.4	1,607.3	3,812.9
April	1,968.2	1,639.5	3,918.2
May	1,775.4	1,752.0	3,847.4
June	2,098.2	1,811.5	4,229.6
July	2,062.7	1,808.5	4,206.4

U. S. Tanker Lead Reduced

The lead held by the United States in its share of world tanker tonnage was further reduced during the first 6 months of 1950, according to an

XUM

analysis issuel by Davies & Newmar, Ltd., London.

Since the beginning of the year, there was an increase of approximately 780,000 deadweight tons in the world total, excluding tonnage in the U. S. Naval Reserve fleet which is estimated at about 1,750,000 tons. The world tanker tonnage rose from 25,465,787 to 26,249,534 tons from January 1 to July 1 of this year.

United States tanker tonnage dropped off while that of the other three major country fleets gained. The position of the four leading tanker countries is shown as follows:

	January 1, 1950	July 1, 1950
United States	7,601,823	7,291,770
United Kingdom	5,893,235	6,110,760
Norway	3,475,388	3,687,683
Panama	2,622,212	2,816,514

During the first half of the year, 10 more American Liberty tankers were converted to dry-cargo vessels. The analysis also reported that the United States tanker fleet, 80 per cent was built during the war compared with 51 per cent for Panama, 40 per cent for Britain, and 21 per cent for Norway.

FAR EAST

Sales Denied

American companies say no oil going to Reds

AMERICAN oil companies marketing in the Far East have again made clear that no sales whatever of crude or products are being made to the Chinese Communists.

Standard Oil Co. (N. J.) last week issued a statement denying "categorically and unequivocally" that it or any of its subsidiaries are making such sales. The company's statement followed the broadcast of a radio commentator declaring that sales to the Chinese Communists were "allegedly" being made by a Standard Oil Co.

Jersey Standard and Socony-Vacuum Oil Co., Inc., share ownership of Standard-Vacuum Oil Co. Before the Communist conquest of the Chinese mainland, Standard-Vacuum was an important supplier of the China market.

California Texas Oil Co., Ltd. (Standard Oil Co. of California and The Texas Co.) stated some time ago that it had halted all sales to the mainland of China on its own initiative at the outbreak of the Korean War and shortly before the formal request from the U. S. State Department. The company has not sent a tanker into Shanghai in 14 months.

The third company formerly supplying the China market, Shell, stopped all sales to the Chinese Communists in mid-July. The British Government followed the U. S. State Department in requesting such action, and subsequently British officials commandeered all Far East British oil stocks for operational military use.

Embargo hurt.—A recent report from Hong Kong said that it was estimated the Chinese Communists were receiving only about 10 per cent of their former oil requirements from Russian sources and that the Anglo-American embargoes on petroleum shipments were having a serious effect. The Communist regime needs petroleum products, particularly lubricants, for its planned industrial program and also for the expansion of mechanized units of the army.

It was reported that an increasing number of trucks and automobiles are being converted to charcoal burners in Kwangtung and that the Tientsin-Canton commercial air route established by the Communists had suspended regular service partly because of the shortage of aviation fuel. British authorities in Hong Kong were cracking down on oil smuggling.

Despite these reports, it was pointed out that China, because of the unindustrialized nature of the country, is able to do without much of the 20,000-25,000 bbl. daily which was being imported prior to the Communist conquest.

EUROPE

Carbon-Black Plant

Operations are scheduled to begin in the next few months at a new carbon-black plant built in England by an independent English company under a Phillips Petroleum Co. license.

The plant, using oil, will produce about 50,000 long tons annually. Most of the production will go to the rubber industry in the United Kingdom, though some may be exported. The company, Philblack, Ltd., which is publicly owned, first undertook plans for the plant early in 1949.

The site at Avonmouth (Bristol) occupies 18 acres and has facilities to store more than 100,000 bbl. of oil. Annual consumption at the plant will be 60,000-70,000 long tons (about 420,000-500,000 bbl.) of gas oil. The company is planning to increase capacity if government approval can be obtained. Phillips has technicians in England assisting with the construction.

The Philblack, Ltd., plant, costing about $4,200,000, is expected to result in a reduction of the United Kingdom black imports by $8,000,000 annually. It is one of two carbon-black plants built in England since the war. The other, belonging to Cabot Carbon, Ltd., is at Ellsmere Port near Liverpool, and has capacity of about 10,000 tons annually.

MIDDLE EAST

Persia Gets Another Loan

Anglo-Iranian Oil Co., Ltd., has made another loan, amounting to £8,000,000 ($22,400,000), without interest, to the Persian Government against future royalties, according to an announcement in Teheran.

The advance was made under the present concession agreement. This is to be revised with higher royalties by a supplementary agreement now awaiting ratification in the Persian parliament. Earlier this year, Anglo-Iranian made a loan of £6,000,000 ($16,800,000) to the government.

The new loan was made in response to a request from the government, and in the Persian capital it was considered that it disposed of certain propaganda allegations that the country's critical economic condition had been used by the company as pressure to obtain ratification of the revised concession agreement.

Casing Set on Trucial Test

The Ras Sedr wildcat on the Trucial Coast in the Persian Gulf is now at about 8,000-ft. depth where 8⅝-in. casing has been set.

The Ras Sedr well was spudded in early this year by the Iraq Petroleum Co., Ltd., organization whose associate, Petroleum Development (Trucial Coast), Ltd., holds concessions in the area. The well, first test on the Trucial Coast, ran into considerable difficulty with lost circulation, and sea water was used in the hole.

The Jurassic production in nearby Qatar is obtained from about 6,000 ft. The same formation is not expected on the Ras Sedr location until 10,000 or 12,000 ft. is reached. Ras Sedr is in Abu Dhabi, one of several small shiekhdoms along the coast.

LATIN AMERICA

Bolivian Wildcat Finds Oil

Oil is reported to have been found at 860 m. (about 2,800 ft.) in a wildcat well drilled on the Los Monos structure in southern Bolivia.

The operation was carried out by Yacimientos Petroliferos Fiscales Bolivianos, the government oil agency. The well was reported capped, and no estimates of its potential have been made.

The structure, first studied by the Standard Oil Co. (N. J.) organization before its properties were taken over in Bolivia in 1937, is located about 18 km. north of Sanandita where Y.P.F.B. now has some production. Geologically, the area is characterized by overthrusts from west to east. Production comes from Devonian sandstone.

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XUM

Steps Up

Sinclair Refining names Tibbets vice president

ROY J. TIBBETS, veteran pipe-line official of Sinclair Refining Co., has been elected a director and vice president in charge of all crude and products lines for the company.

Tibbets' new position was one of several changes in management personnel announced by P. C. Spencer, Sinclair Refining president, following the retirement of W. W. Baker, former vice president in charge of all pipe-line operations.

Tibbets joined the engineering department of Prairie Pipe Line Co. in March 1915, at Independence, Kans. In 1929, he was made district foreman of the western district of the Prairie company with headquarters at Wichita, and continued in the same position when Sinclair acquired the Prairie system.

In 1935, Tibbets was appointed assistant general superintendent in charge of the northern division trunk lines of the Sinclair company's crude-oil pipe-line system, and in 1937, was elected vice president of Sinclair Refining in charge of crude pipe lines with headquarters in Independence, a position he held until his latest advancement.

He will continue in Independence where the Sinclair pipe-line headquarters are located. The Sinclair system now consists of 10,800 miles of crude lines and 2,800 miles of products lines.

William H. Morris succeeds **R. J. Tibbets** as vice president and general manager of crude-oil pipe lines for Sinclair Refining Co. Since May 1948 he has been manager of products pipe lines and since May 1949 he has also functioned as superintendent of communications for both the crude-oil and products systems. From the time he started with Sinclair in Tulsa in 1933 he has had wide experience with the firm. **Lewis B. Moon** succeeds Morris as general manager of products pipe lines. He started with Sinclair Oil & Gas Co. in 1927 in Seminole, Okla., and has recently been Southwest division superintendent of the products system.

W. H. MORRIS

Charles E. Davis, geologist for Gulf Oil Corp., has been transferred from Crane, Tex., to Fort Worth in the same capacity.

J. K. Welchon, engineer for Phillips Petroleum Co., has been transferred from Beaumont, Tex., to Houston in the same capacity.

Thurman Geddie, district geologist for Sunray Oil Corp., has been transferred from Lake Charles, La., to Houston in the same capacity.

Quentin M. Moore, geologist for General Petroleum Corp., has been transferred from Coalinga to Hanford, Calif., in the same capacity.

Joe T. Holloway, drilling superintendent for Rowan Drilling Co., Inc., has been transferred from Jal, N. M., to Fort Worth, Tex., in the same capacity.

G. H. Summers, production foreman for Continental Oil Co., has been transferred from Aransas Pass to Sherman, Tex., in the same capacity.

Milton H. Kuhleman, exploration geologist for The California Co., has been transferred from New Orleans to Jackson, Miss., in the same capacity.

Milton A. Dewey, formerly with E. I. du Pont de Nemours & Co., Inc., has joined Canadian Industries, Ltd., Toronto. Before joining du Pont he was in charge of the analytical laboratory of Gulf Research & Development Corp.

William P. Harvey, party chief for Geophysical Service, Inc., has been transferred from Plainview to Lamesa, Tex., as party chief of the reflection seismograph crew.

W. S. Zehrung, Pennzoil Co., was recently elected president of the National Petroleum Association. Others elected were: **Earle M. Craig,** Freedom-Valvoline Oil Co., first vice president; **A. W. Scott,** Wolf's Head Oil Refining Co., Inc., second vice president; **Elmer R. Erickson,** Northwestern Refining Co., St. Paul, and **A. L. Stallings,** Indiana Farm Bureau Co-Op Association, Inc., to the board of trustees. **Francis E. Miller** of National Refining Co., retired from the trustee board.

Louis Franklin, independent consulting geologist and drilling contractor, has returned to his Houston office from Guatemala where he was engaged in exploration work.

Dr. Louis Schmerling, a research chemist with Universal Oil Products Co., Chicago, has been selected as the recipient of the 1951 Precision Scientific Co. award in petroleum chemistry. Schmerling, who has authored numerous scientific publications and holds a large number of patents dealing with the manufacture of gasoline and chemicals from petroleum, joined U.O.P. in 1935 after receiving his Ph.D. degree from Northwestern University.

J. O. Laws, geophysical party chief for Amerada Petroleum Corp., has been transferred from Brownfield, Tex., to Roswell, N. M., in the same capacity.

Frank W. Lake has been elected third vice president and a director of Wilshire Oil Co. He is manager of the firm's Texas division with offices in Midland, and has been with the company for 10 years.

R. H. Pearson, project engineer in the Chicago office of Pure Oil Co., has been transferred to Columbus in charge of construction of the company's Heath to Dayton, Ohio, product pipe line.

F. A. Coyle, formerly tool pusher for Earl Callaway Drilling Co., Marshall, Tex., has joined Kemp Drilling, Inc., Natchez, Miss., in the same capacity.

William H. Bowersox, formerly district engineer for Texoma Natural Gas Co., Fritsch, Tex., has joined Texas Illinois Natural Gas Pipeline Co., Wharton, Tex., as chief inspector.

PERSONALS

J. W. McFarland, district superintendent for Service Pipe Line Co. in charge of lines in the Illinois division, Galesburg, Ill., has been transferred to Joliet, Ill., in charge of the east district, Illinois division.

Joe A. Perry, formerly production engineer at Victoria, Tex., for the former Barnsdall Oil Co., has been transferred to Alice, Tex., with Sunray Oil Corp. in the same capacity.

T. Dean Mundorf, geologist for Gulf Oil Corp., has been transferred from Topeka to Lewistown, Mont., in the same capacity.

Courtlandt S. Dietler and **Milo B. Siegel,** owners of Independent Western Oil Co., have opened offices in Denver. Dietler was formerly Toronto Pipe Line Co. representative at Casper.

W. H. Thomas, geological scout for Shell Oil Co. in the Ventura district of California, is spending 6 weeks in the company's Los Angeles regional offices in the absence of **E. L. McDowd** who is temporarily working in the Rocky Mountain region.

Thomas W. Blackstone, geologist for Cities Service Oil Co., has been transferred from Houston to Lafayette, La., in the same capacity.

I. K. Nichols, formerly geologist with The Texas Co., Houston, has joined L. D. Cain Drilling Co., Houston.

Andrew J. Ritchie, district gager for Interstate Oil Pipe Line Co., has been transferred from Trout to Washington, Miss., in the same capacity.

John S. Bell, petroleum engineer for Humble Oil & Refining Co., has been transferred from Tyler, Tex., to Los Angeles as district superintendent.

D. A. Howard has resigned as vice president of Republic Natural Gas Co., Dallas, and is returning to Oklahoma City to practice oil law and do engineering consulting work. He has been with Republic 5 years.

L. B. Harrell, Waycross, Ga., has been appointed by **Gov. Herman E. Talmadge** to fill the vacancy on the Georgia Oil and Gas Board, created by the recent death of Judge Harry D. Reed.

Millard K. Neptune, manager of Continental Oil Co.'s foreign department, has been named special Washington representative of the company. In his new position he will also assist all departments in the company's business with federal agencies located in the nation's capital.

R. F. Cory, petroleum engineer for The Texas Co. in charge of the San Joaquin Valley area, Fellow, Calif., has been transferred to the Ventura area at Santa Paula, Calif.

Harold L. Lawler, operating engineer with Stanolind Oil & Gas Co., at the Elk Basin gasoline plant, Elk Basin, Wyo., has been transferred to the Slaughter gasoline plant near Sundown, Tex., in the same capacity.

A. R. DENISON

A. Rodger Denison, chief geologist for Amerada Petroleum Corp., Tulsa, has been elected a vice president. Other changes include: **John F. Hosterman,** named chief geologist, succeeding Denison; and **John P. Thompson** and **Charles S. Agey,** named assistant chief geologists. Denison joined Amerada in 1921 after graduating from the University of Oklahoma, and was named chief geologist in 1937. Hosterman, who joined the firm in 1922 after his graduation from the Missouri School of Mines, has been assistant chief geologist since 1943. Agey joined the company in 1935 after graduating from the University of Rochester, and in 1946 was named district geologist. Thompson joined Amerada in 1933 and was named senior geologist in 1947.

Clyde H. Alexander, L. B. Herring, Lyon F. Terry, John B. Tweedy, John T. Snyder, Jr., and **Henry C. Spoor** have been elected to the board of directors of Southern Production Co., Shreveport.

John H. Bevel, zone agent at Calgary, Alta, Canada, for Gulf Oil Corp., has been named general manager of Gulf's Canadian district. Other changes include: **R. P. Lockwood,** named exploration manager; **P. L. Gassett,** appointed exploitation manager; **O. A. Erdman,** named chief geologist; and **R. W. Schweigert,** named chief scout. Lockwood, who has been with the firm 17 years, was formerly zone geologist at Calgary. Gassett was formerly general production foreman at Edmonton, and has been with Gulf for 15 years. Erdman was previously a geologist in Canada, and has been with the firm for 4 years. Schweigert was formerly a scout at Evansville, Ind., covering the tri-state region for Gulf.

John W. Savage, formerly at Golden, Colo., doing oil-shale research for C. H. Dragert Co., has moved to De Beque, Colo., and has organized the Savage Oil Shale Development Co.

Robert L. Ley, manager of construction and operation for Kentucky West Virginia Gas Co., Ashland, Ky., has been elected vice president in charge of operations with headquarters in Prestonsburg, Ky. He attended the University of Pittsburgh, and is a member of American Petroleum Institute, and the Kentucky Oil and Gas Association.

Rex M. Grivetti, geologist for The Texas Co., has been transferred from Taft to Bakersfield, Calif., in the same capacity.

D. D. Utterback, exploration geologist for Houston Oil Co. of Texas, has been transferred from New Orleans to Houston in the same capacity.

MYRON C. KIESS

Myron C. Kiess, formerly chief geophysicist in charge of geophysical explorations for Pure Oil Co., Houston, has joined Mid-Continent Petroleum Corp., Tulsa, as chief geologist, succeeding **Albert L. Beekly** who has retired. Kiess, who joined Pure in 1926 after graduating from the Colorado School of Mines, was former vice president of the Tulsa Geological Society. Beekly, who served for 33 years as head of the geological department for Mid-Continent, will remain in a consulting capacity for an indefinite period.

George Hathaway has joined the geological staff of Sinclair Oil & Gas Co. at Evansville, Ind. He is a recent graduate of Tulsa University.

S. H. Bean, Shell Pipe Line Co., has returned from Venezuela where he has been working in connection with construction of the "Steep Inch" products pipe line for Shell Caribbean Petroleum Co. as division superintendent of the Wasson, Tex.-Hobbs, N. M., district. **W. H. Craddock** will become superintendent, Bayou Pipe Line System, Port Neches, Tex.; **C. H. Salter** will become acting district su-

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XUM

PERSONALS

perintendent, Kilgore, Tex.; **W. R. Yates, Jr.,** will become acting district foreman, Kilgore; and **P. M. Crenshaw,** who has been acting for Bean during his absence, will return to his post as district foreman at Benedum, Tex.

William T. Van Ravenswaay, refinery engineer for California Texas Oil Co., Ltd., has been transferred from Awali, Bhrein, Persian Gulf, to the New York engineering office.

Lee Denny has been named production superintendent of the new branch office for Burdell Oil Co. at Snyder, Tex.

Jack Waggoner, petroleum engineer for Gulf Oil Corp., has been transferred from Sundown to Sand Hills area near Crane, Tex., in the same capacity.

B. O. Winkler, geologist with Standard-Vacuum Oil Co., has been elected president of the eastern section of the American Association of Petroleum Geologists in New York. Other new officers are: **A. John Haworth,** The Texas Co., vice president; **Brooks F. Ellis,** New York University and American Museum of Natural History, treasurer; and **Robert E. King,** The Texas Co., secretary.

Dr. Sidon Harris, president of Southern Geophysical Co., and **Dr. Sigmund Hammer** of Gulf Research & Development Corp. of Pittsburgh, have been nominated for the office of presidency of the Society of Exploration Geophysicists.

P. E. Goth, Jr., process engineer for Phillips Petroleum Co., has been transferred from Pampa to Phillips, Tex., as process-engineering supervisor.

Jack Allen Morgan, petroleum engineer for Sun Oil Co., has been transferred from Brookhaven, Miss., to Delhi, La., in the same capacity.

E. G. Bilderback, production engineer for Magnolia Petroleum Co. at Luling, Tex., has been transferred to Kermit, Tex., as mud engineer.

Charles Grau, Oneida Gas Co., Rhinelander, Wis., has been elected president of the National Butane-Propane Association. Other officers elected were: **Edwin E. Hadlick,** Minneapolis, executive vice president; **H. J. Winton,** Winton Automatic Gas Co., Beaumont, Tex., vice president; **Alvin J. Woefle,** Illinois Butane Gas & Equipment Co., Bloomington, secretary; and **John D. Coughlin,** Westland Oil Co., Minot, N. D., treasurer.

Gilbert W. Rice has been named district foreman of the Quitman, Tex., district for Pan American Pipe Line Co., with headquarters at Quitman, and **Hayne Nelms,** formerly at Longview, Tex., has been named chief station engineer in charge of the new main trunk line pumping station at Colorado City, Tex.

Edward M. Wheeler, petroleum engineer for British-American Oil Producing Co., has been named district superintendent for the San Joaquin Valley of California. **Jack L. Hollis,** formerly geophysicist for Petroleum Consultants, Inc., Tulsa, has joined the firm in Tulsa as geophysicist.

C. F. McGoughran and **H. H. Fuller,** Sinclair Refining Co., have been elected vice presidents of the firm. McGoughran, who joined the company in 1920 at Chicago, will continue as general sales manager, a position he has held since April 1, 1949, and Fuller, who has been manager of bulk sales since 1928, will direct all wholesale activities of the firm.

C. McGOUGHRAN

H. H. FULLER

B. L. Francis, district petroleum engineer for The Texas Co., has been transferred from New Orleans to Houma, La., in the same capacity.

C. E. Van Gundy, geologist, has been transferred from Albany, Calif., to Los Angeles in the same capacity.

Don O. Chapell, vice president of the exploration and land department of Sunray Oil Corp., Tulsa, has resigned to become associated in land and geological work with **Jake L. Hamon,** independent oil operator, Dallas. Chapell joined Transwestern Oil Co. in 1937 and has been associated with Sunray since the merger of Transwestern Oil Co. into Sunray in 1946. He was named vice president of the exploration and land department in 1948, and was previously district geologist in San Antonio. Other changes include: **George A. Schwab,** appointed manager of the land department; and **E. A. Markley,** appointed chief geologist in the Mid-Continent area. Schwab entered the oil business in 1920 with Phillips Petroleum Co., and joined Barnsdall Oil Co. in 1926. He became affiliated with Sunray in June 1950 when Sunray and Barnsdall merged. Markley joined Waite Phillips Co. in 1924, later joining Barnsdall in 1926, and becoming affiliated with Sunray in June 1950 when the two companies merged.

D. O. CHAPELL

J. F. Jeansonne, district petroleum engineer for Humble Oil & Refining Co., has been transferred from Brookhaven, Miss., to Odessa, Tex., in the same capacity.

DEATHS

Sam R. Harwell, 57, controller of Magnolia Petroleum Co., died September 23 in Dallas. He joined the firm after graduating from the University of Texas in 1920.

Norman A. Lindsay, 57, traffic manager of Warren Petroleum Corp., died in Tulsa September 20.

Leo Ranney, 66, inventor of a method for horizontal drilling for oil, died September 17 near Morro Bay, Calif.

J. D. Ladd, tool pusher for Reserve Drilling Co., died July 30 in Newcastle, Wyo.

H. O. Prideaux, 68, oil operator, died September 21 in Fort Worth.

Charles Morgan Edwards, 52, a partner in the firm of Edwards & Yonker, oil-field suppliers, died September 16 in Alice, Tex.

Don J. Gamble, 44, assistant geophysical-shop supervisor for Carter Oil Co., died recently in Tulsa.

Cleve M. Brown, 29, geologist with the Panhandle Oil Co., Dallas, died September 16.

C. E. Gallman, 72, long time district manager for the Oil Well Supply Co., died September 24 in Tulsa.

L. E. Jennings, 59, administrative assistant for Service Pipe Line Co., died September 25 in Tulsa.

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ESTERON 245, a low volatility ester of 2,4,5-T with four pounds of 2,4,5-T acid equivalent per gallon. This product controls woody plants in the same manner as Esteron Brush Killer. It is particularly effective on 2,4-D resistant species such as brambles, hawthorn, mesquite, osage orange, palmetto and poison ivy. Also very effective for stump treatment and dormant bark application.

DOW SODIUM TCA 90% controls annual grasses and established perennial grasses including Johnson, quack and Bermuda. Does not present a fire hazard, neither is it poisonous to livestock grazing on treated foliage. Mixes readily with 2,4-D for weed as well as grass control in the same application. Stores well and is easy to handle. At low dosages, it can be used to retard growth without killing, where a light grass cover is desired.

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XUM

Increased Oil Recovery from Injection Operations

by R. L. Evans* and R. P. Roe*

OIL men have long been aware that they are faced with one of the most provocative problems of modern industry—of all the oil discovered in depletion-type reservoirs, no more than 30 per cent can usually be recovered by the "primary" means of natural production. Except for the water-drive pools, such as are found in East Texas and the Gulf Coast, the great majority of known reservoirs are of the depletion type, and the 30 per cent recovery limitation applies to the majority of the oil located up to the present time.

What is a depletion type pool? Essentially, it is an oil accumulation from which we can draw oil in the same way as one can draw air or gas from a container in which it has been compressed; a spare tire, for instance, or a welder's oxygen tank, or a DDT bomb. Open the container to the atmosphere and gas is forced out by the pressure inside. There is a limit to the amount of gas you can withdraw because as "production" continues the pressure drops; flow ceases when the pressure is depleted.

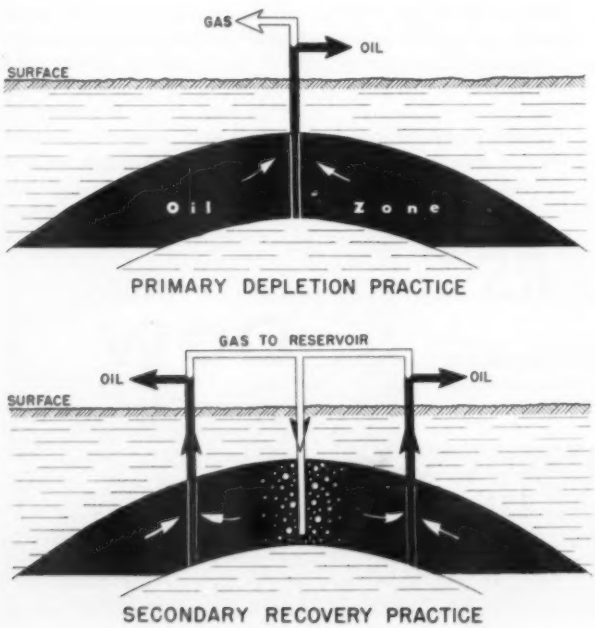
Like these familiar examples, the depletion-type oil pool is a high-pressure container of constant dimensions holding oil in which gas is dissolved. The oil reservoir is more complex than containers holding gas alone, but the principle is the same. The pressure of the fluids causes them to flow out of the reservoir, and production will continue until the pressure is depleted. The energy which produces oil from this type of reservoir is inherent in the oil and gas, and not in an outside energy, such as a water drive, which flows into the container and in effect, reduces its size as oil and gas are withdrawn.

The recovery we can obtain by normal producing methods from this natural energy is less, as we have said, than 30 per cent of the oil originally in place; it may be as low as 10 per cent. The prospect of artificially increasing the recovery percentage is a constant concern of the oil industry, and has stimulated many novel ideas. The reader may recall, for instance, a recent proposal to introduce into the oil reservoirs bacteria that can survive and expel oil as they multiply. As another extreme, Russian engineers claim they have set depleted oil sands on fire and recovered hydrocarbons by underground distillation. These are both distinct possibilities, but for the time being are still in the province of research.

Somewhere between these extremes are less-spectacular techniques which have been made to work on a practical scale. The principal method of artificial, or secondary, recovery is injection of air, gas, or water with the object of renewing or maintaining pressure as illustrated on Fig. 1. The practicality of the method is self-evident, since one or more of the injection fluids is usually available at moderate cost.

Injection of air or gas into an oil

*Reservoir engineers, Stanolind Oil & Gas Co.



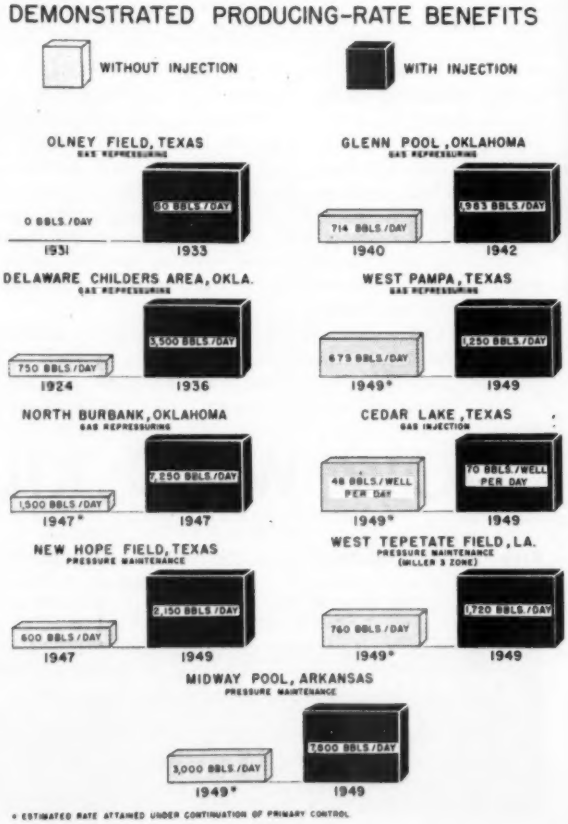


Fig. 1—(Below) Production practices for the depletion-type reservoir. Fig. 2—(Right) Actual field performance for injection and pressure maintenance projects.

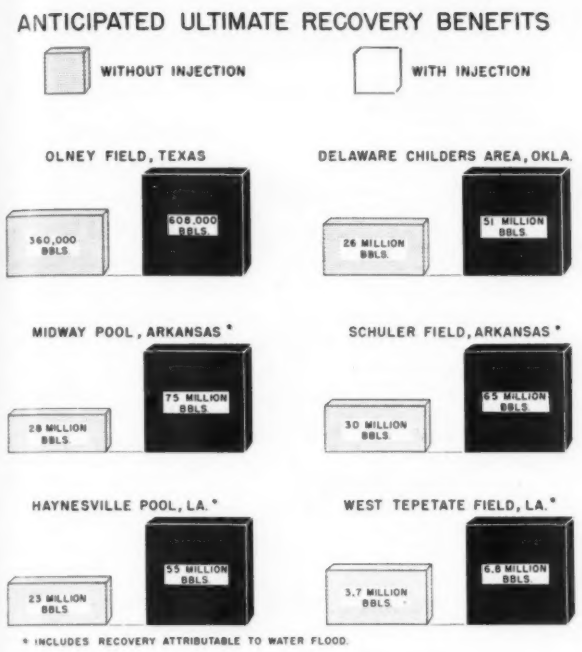


Fig. 3—Recovery data for injection and pressure-maintenance projects.

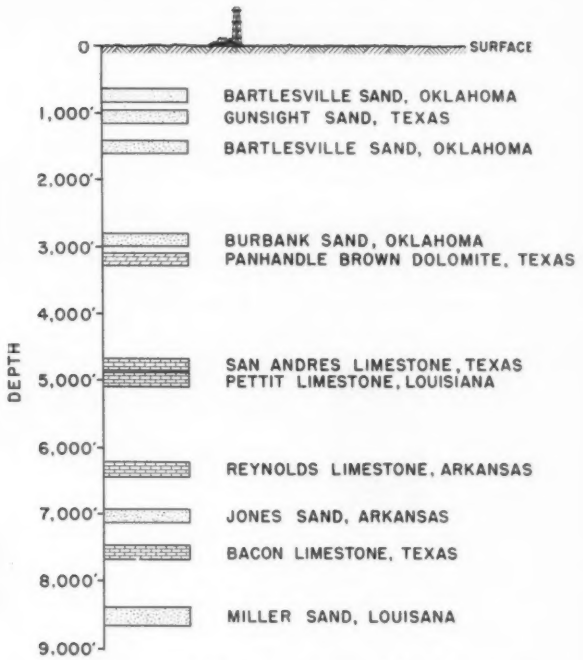


Fig. 4—Depths and formations of proved injection successes.

reservoir was first attempted by I. L. Dunn[1] in 1903 in Macksburg, Ohio, pool. The process was patented and was first commercially applied on a property near Chesterhill, Ohio, in 1911. The project, an air-repressuring experiment, met with immediate success, and was followed by rapid growth in application of the practice. By 1942, when the American Petroleum Institute assembled its symposium, "Secondary Recovery of Oil in the United States," more than 372 active air-gas injection projects, affecting 229,000 acres and 18,800 producing wells, were in operation in this country.

During the intervening years many more projects were initiated, and carried to successful completion or abandoned as failures. The industry learned that air or gas injection is not always beneficial, that it may sometimes be moderately successful in increasing recovery but not profitable. But, success or failure, each project added to the wealth of experience being developed with artificial-recovery techniques. And, success or failure, each project provided new data to be fed into the extensive research programs being pursued in the industry.

In the past 20 years this phase of the industry's know-how effort, exerted through the research departments of major companies, federal agencies, state universities and colleges, and cooperative associations, has absorbed millions of dollars and the work of hundreds of highly trained specialists in geology, physics, chemistry, and mathematics. Their contributions to understanding of the characteristics of oil-reservoir fluids and oil-reservoir rocks have been gathered and disseminated throughout the oil world by groups of interested companies and technical men and by technical publications.

Predict With Accuracy

This accumulated experience and technical information enables the modern operator to predict with reasonable accuracy the probable degree of success or failure to be expected from any specific project. His judgment is made, not from a blanket affirmation or condemnation of the merits of a particular technique in a particular type of rock formation, but from studies of the reservoir concerned in the light of all its characteristics, both fluid and rock, and in the light of the economic situation in the industry.

With the assurance that many of the pitfalls and hazards characteristic of artificial-recovery methods can be avoided, producers are more aggressive than ever before in locating and developing artificial-recovery prospects. However, no operator can be assured in advance that injection operations will in a given instance result in a specified increase in recovery or, in fact, in any increase whatsoever. He may reasonably expect certain beneficial results and be willing to risk substantial additional investment in endeavoring to obtain them, but he cannot be assured that his efforts will be successful, regardless of the fact that he has every reasonable expectation that such will be the case.

As is discussed more fully below, the advantage to be gained by gas injection is a matter of increased yield. The physical effects of injection are higher producing rates over the life of the operation, and the recovery of a greater percentage of the oil in place, than would be possible by normal production methods. As a by-product of the technique, salable hydrocarbons, such as gasoline, propane, and butane, are often extracted from natural gas in the plant that processes and returns it to the reservoir, providing an additional yield in high-quality products.

All agencies interested in the producing operation may share in these benefits. From the point of view of the producers, gas injection may bring higher rates and greater ultimate yield. From the point of view of royalty owners, the technique provides a greater ultimate yield at higher rates from their interest. Since the producers bear the cost of conducting artificial-recovery operations, these benefits come to royalty owners without additional cost. Governmental activities benefit through additional revenues on oil taxes. From the point of view of the public, who have a bona fide interest in the conservation of our natural wealth, gas injection is one path to more efficient exploitation of petroleum resources.

Unit Operation Necessary

More than the physical act of injection is often necessary to obtain the benefits of artificial-recovery techniques. Since an oil reservoir is in reality an overgrown vessel filled with compressed fluids, it is obvious that the mass of fluid will behave as

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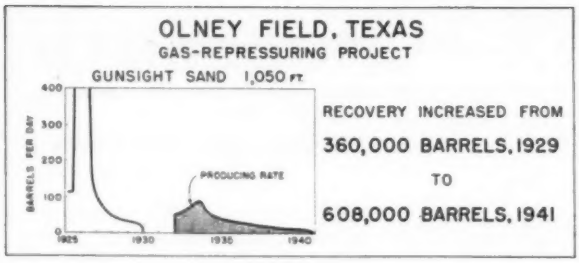
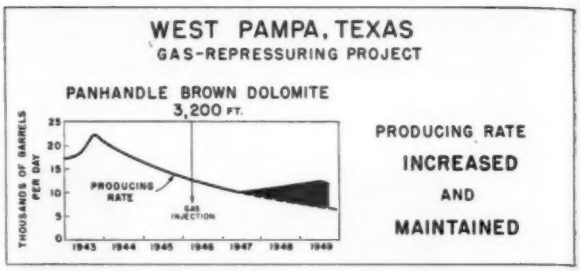
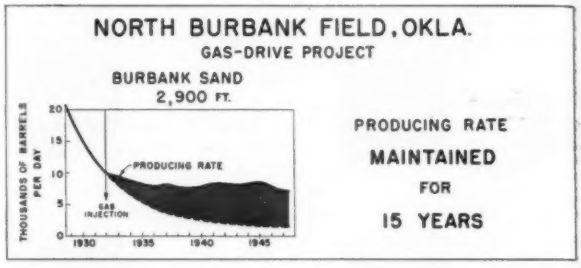
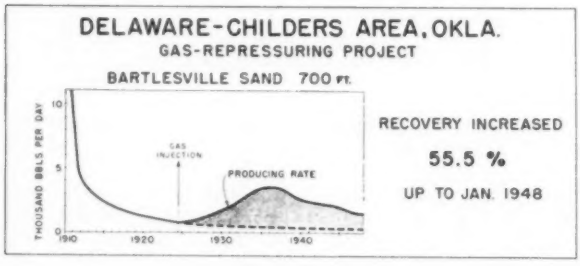








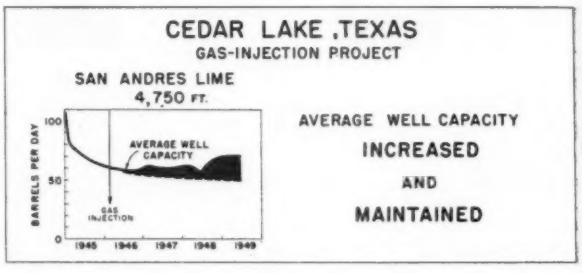


Fig. 5—Production-rate data.

Fig. 6—Increased recovery data.

a unit in reacting to a combination of externally applied influences such as production and injection. This behavior is no respecter of lease boundaries. Frequently, injection will do little good to a particular lease while the advantages of injection will appear on adjacent property. The natural result of such behavior is to discourage the practice of injection at the start, unless the operator of the injection lease can get compensation for the benefits in recovery which his neighbor reaps.

A solution to this problem lies in the practice of operating an oil pool as a unit, without regard to lease boundaries. Gas can be injected where it will do the most good, and oil can be withdrawn where it will not compromise the success of the project. The practice permits the operator to experiment on a field-wide basis until the most effective use of injection techniques has been determined, and to establish a production program which will obtain the maximum amount of oil that is economically possible to recover.

The potentialities of repressuring and pressure-maintenance operations are best illustrated by reference to the operations themselves. Criteria of success range from simple demonstration of desirable benefits, as illustrated by Figs. 2 and 3, to technical conclusions arising out of complex mathematical analysis. The variety of effects observed, and of problems created, in injection pools is almost as great as number of operations tried.

Certain successful projects, however, lend themselves to direct demonstration of the kind and degree of results that may be expected, and the variety of conditions in which the technique may be applied. These are by no means the only successful projects of their types, nor are they the most successful known to the industry. These are projects whose results enable the average observer to draw his own conclusions with respect to the potentialities of artificial-recovery techniques. The operations selected include representatives of all the known types of productive formation, except the infrequently productive shales, and in depth they cover a range common to nearly all of the known oil reservoirs in the United States, as can be seen by reference to Fig. 4.

Olney Field, Young County, Texas

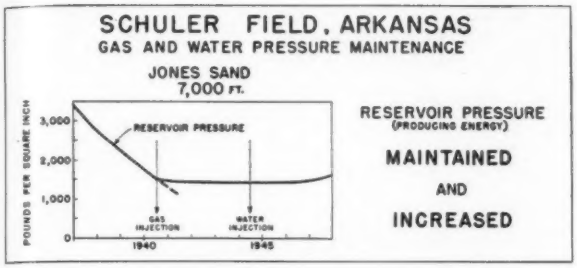
An outstanding example of the use of gas injection late in the life of a pool is provided by Olney, or Mercer, field[3] in Young County, Texas, where a small sand reservoir was rapidly exhausted by primary means and had reached the point of abandonment by the end of 1929. During the following 2 years, 107 million cubic feet of gas were compressed and injected into the sand with no further withdrawals. Since reservoir pressures constitute the energy that moves oil out of the formation rock and into the well bore, the fundamental effect of this gas was to increase those pressures, and thus to restore the productive capacity of the formation. The formation was "repressured," that is, the pressure was raised, to approximately that which had existed at the time of discovery. Put back on production with continued gas injection in 1932, as shown on Fig. 5, the pool produced at an economic rate for 9 years, delivering up 248,000 bbl. of oil in excess of the 360,000 bbl. which had been recovered by primary depletion methods.

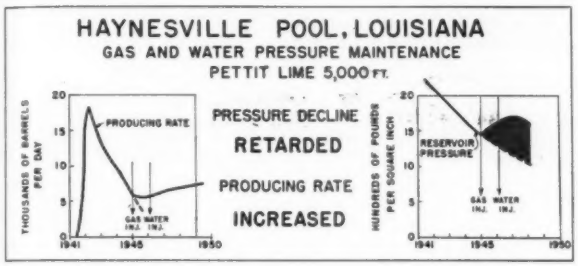
The gain amounts to an increase of 69 per cent in ultimate recovery as the result of gas injection. Having the entire field under one lease, the leaseholder was able to operate the pool as a unit for maximum efficiency, the only flaw in an otherwise dramatic success existing in the fact that the injected gas had to be purchased from outside the field.

Oklahoma Pools—Bartlesville Sand

Initiation of low-pressure gas injec-

(Continued on page 88)





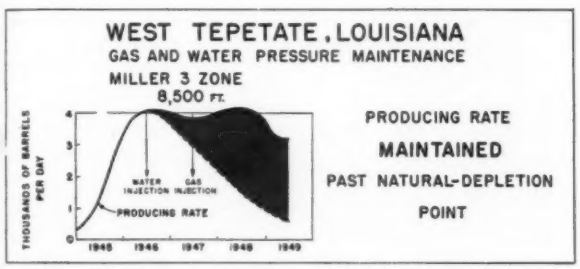
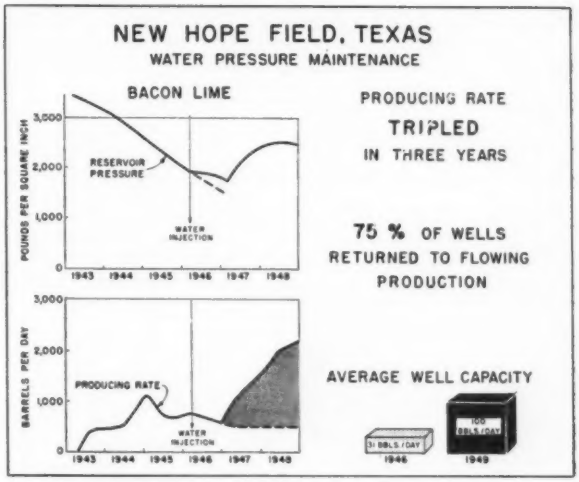


Fig. 7—Production-data curves, injection operations.



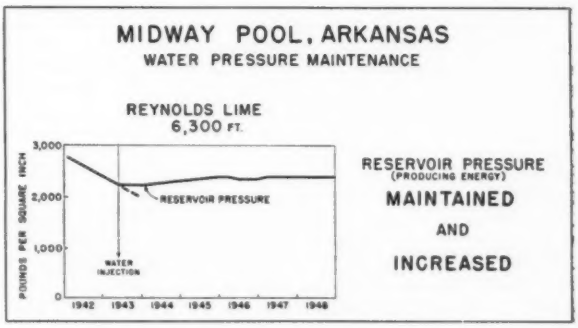
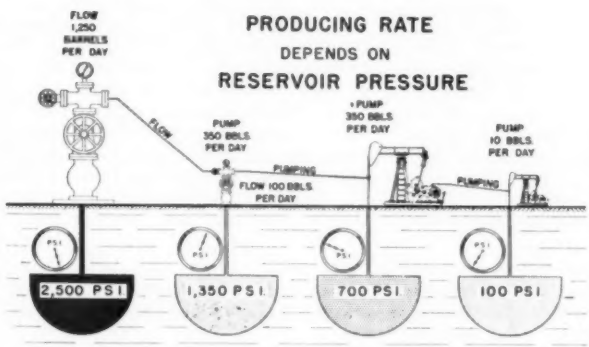
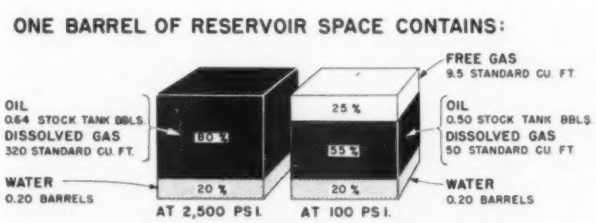


Fig. 8—Data for water pressure maintenance

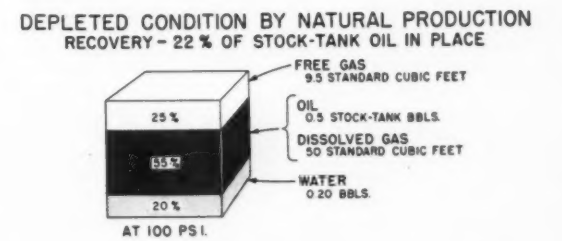


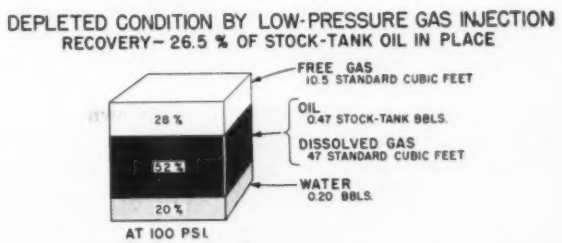


FLUIDS PRODUCED ARE:

	AT 1,350 PSI.	AT 100 PSI.	
OIL	0.0069	0.14	STOCK-TANK BBLS.
GAS	3.45	260.5	STANDARD CU. FT.
RECOVERY	1.07 %	22 %	OF STOCK-TANK OIL ORIGINALLY IN PLACE

Fig. 9





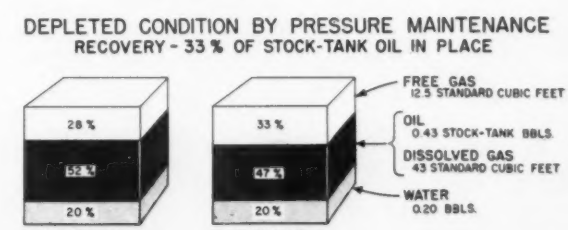


Fig. 10

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Now on its first location is the industry's newest drilling barge, which is described in the accompanying article. The unit is designed for drilling wells to 15,000 ft.

by Leigh S. McCaslin, Jr.
Houston District Editor

1. The Gibbens is shown here on the ways at Levingston Shipbuilding Co.'s Orange, Tex., yard. Drilling equipment had not yet been installed when this picture was taken.

Texaco's Drilling Barge Gibbens

THE TEXAS CO.'S Louisiana Division has put into service its newest drilling barge, the "Gibbens," which is designed to drill wells to 15,000 ft. This is the fourteenth barge in the company's drilling barge fleet for operation in the Gulf Coast area.

This new drilling unit was built at the Orange, Tex., shipyards of Levingston Shipbuilding Co. under the supervision of the Louisiana division which is headed by R. L. Keyes, Texaco division manager. The detailed design and physical construction were supervised by S. F. Rowan, equipment engineer for the Louisiana division. The barge was constructed as a turnkey job, ready to go on location immediately after leaving the builder's yard. It is of all-steel welded construction. First hole for the new barge is The Texas Co. 33-1 Bay St. Elaine, Terrebonne Parish, Louisiana.

The Gibbens is 160 ft. long by 54 ft. wide and has a depth of 12 ft. The drilling slot is 82 by 10 ft. It has six main hull compartments, of which two in the midship section are used for fresh-water storage of approximately 1,500 bbl. each. The other four main compartments are ballast tanks for sinking the barge at the drilling location. Sea water is admitted to these tanks through four 12-in. seacocks.

The superstructure under the derrick has a height of 18 ft. to provide adequate headroom for modern blowout-preventer equipment. This superstructure is designed to support a 600,000-lb. rotary load, 300,000-lb. load at each derrick corner, and 8,000 lb. per sq. ft. in the pipe-racking area on the derrick floor.

Details of Mud System

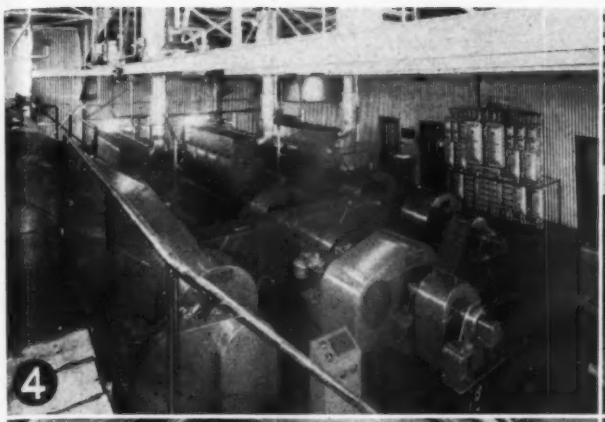
There are two active mud pits, each complete with its settling tank which allows one tank to be cleaned while the other tank is in operation. The three mud guns in each tank are "bottom type." The mud tanks are drained by quick-opening spring-loaded valves. Reserve mud storage and fuel-oil storage is provided in four tanks located under the pipe rack.

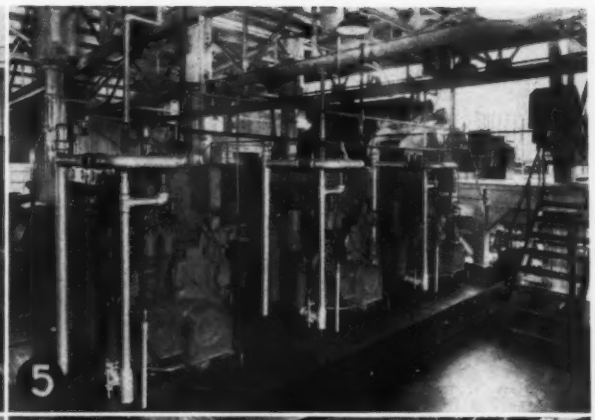
The design of the mud-piping system is such that in the event of a cutout or failure in one line there is another line that can be used, thereby holding shutdown time to a minimum. Angle-iron brackets are used wherever possible to secure the piping and hold vibration to a minimum. Especial attention was given to installing the piping in such a manner that there is no crowding or interference with the movement of workers.

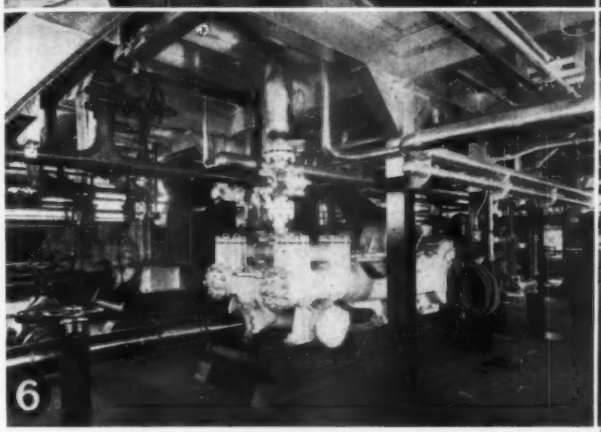
The National Supply Co. Ideal Type 130 draw works, a new unit in the National line, is especially designed to make it more readily adaptable for drilling-barge installation. Special features incorporated in this draw works are heavily constructed chain drives and a large drum grooved for 1⅜-in.-diameter drilling line. The compound drive is designed in six sections, including chain drives to the main mud pumps, to facilitate its installation on the drilling barge. Marine-type bases were provided for the engine foundations rather than the usual oil-field-type skid.

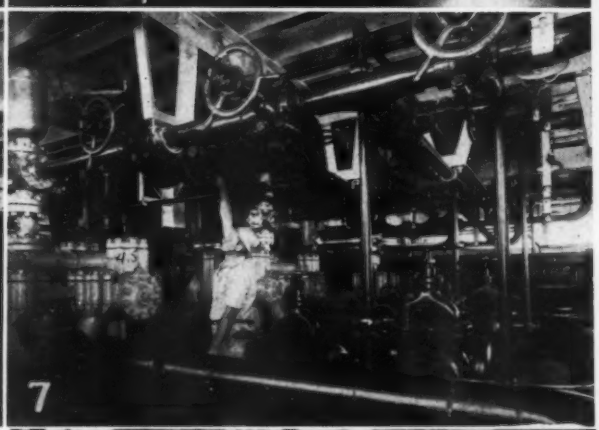
The pipe rack on the Gibbens is

2. Stern end of the barge houses the tool pusher's office, crew quarters, and complete kitchen. The conveyor belt in the picture is swivel mounted so that it can be swung around to load drilling mud materials from barges into the mud room. 3. Over-all view of derrick floor. Included in the equipment is a new model draw works with electric brake, new model power slip, and numerous other features. Note protective grillwork shield around driller's position.







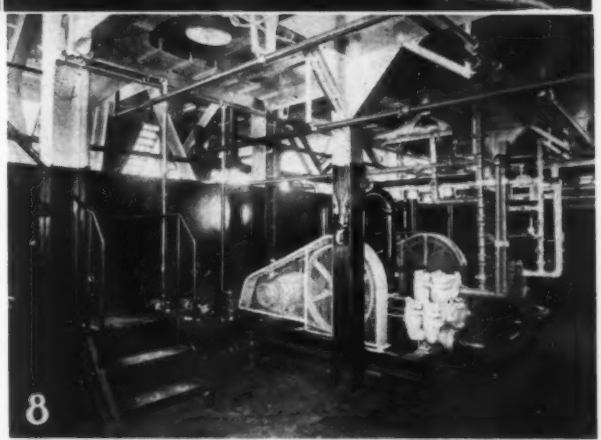


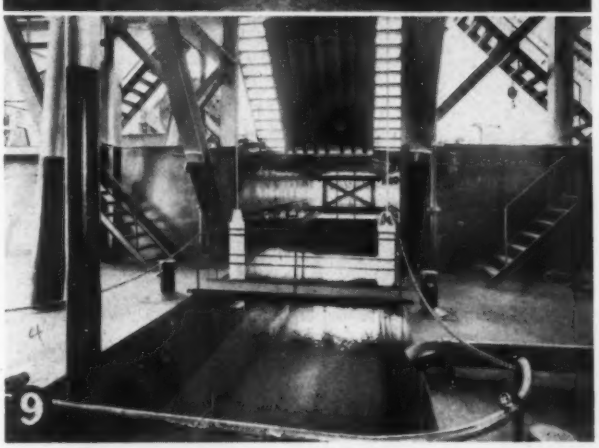
4. The three main engines are rated for intermittent service at 460 hp. each at 900 r.p.m. Fluid drive is used to connect the engines with the rig drive.

5. Marine-type bases are provided for the engine foundations rather than the usual oil-field-type skid.

6. The two main slush pumps are 7¾ by 18 in. rated at 600 b.hp.; the mud-mixing pump is 7½ by 14 in., rated at 225 b.hp.

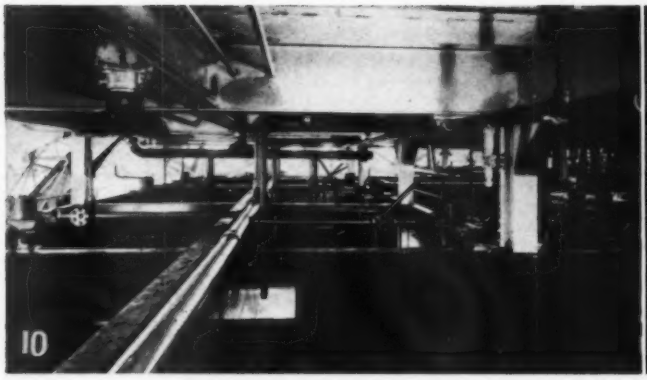
7. Maximum effort was made to keep piping and valves accessible, but still not in the way of drilling-crew members; much is installed overhead.



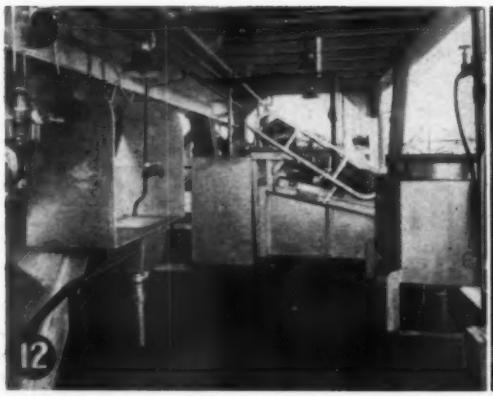


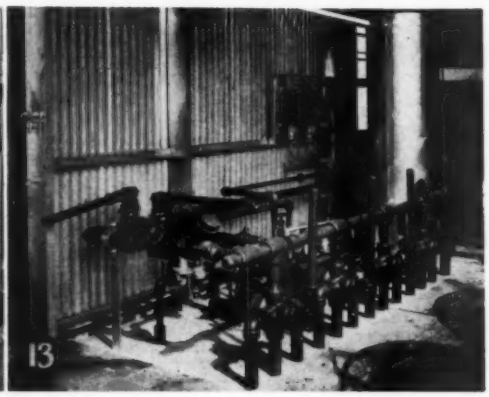
8. The two electrically driven wash-down pumps are 5 by 6 in., 15 hp.

9. Drilling slot on the Gibbens is 82 by 10 ft.



10. Barge has two active mud pits, each complete with its own settling tank. The three mud guns in each tank are "bottom type." 11. Electric power is provided by two 75-kw. generators, which are driven by the two diesel engines shown in this photo. One of the two starting air compressors on the rig appears at right.





12. Mud-testing and chemical-handling equipment can be seen here with the shale shaker in the background. 13. Quick-action-type manifold adjacent to rig floor is for blowout-preventer controls. The best of blowout prevention equipment is extremely important in marine drilling.

served by two 5-ton stiff-leg derricks fitted with bull wheels for swinging. Power is supplied by air hoists. There are two ratholes extending through the hull of the barge up to and 24 in. above the derrick floor level.

The derrick floor is covered by steel plate on which is installed 3-in. wood planking set in asphalt. All steel work above the slot between the center of the well and the end of the slot is removable.

The operations and quarters house has a solid welded steel roof, supported by bow-string trusses. The roof trusses are designed and located so that their bottom chord is used as a trolley beam for servicing the diesel engines. Accommodations are provided in the quarters for eight men for emergency use by the drilling crews, or for service personnel that may be required on the job from time to time.

Electric power for the operation of electric motors and lighting is provided by two a.c. generators driven by diesel engines. The switchboard, motors, and other electric fixtures are of the explosionproof type. Sound-powered telephones are used for

(Continued on page 78)

Texaco men responsible for the design and operations of the new Gibbens drilling barge are shown above: R. A. Abbott, petroleum engineer; J. Chandler, district superintendent, Harvey district; Jack Koch, marine representative, Houma, La.; R. B. Edmonson (formerly with The Texas Co.); S. T. McCardell, general superintendent, drilling and production; Douglas Fugler, district engineer, Harvey district; J. L. Shea, Jr., district superintendent, Houma district; Rosea Campbell, assistant district superintendent, Houma district; Jim Gibbens, assistant district superintendent, Harvey district; Spencer Rowan, petroleum engineer; and J. A. Battle, Jr., division petroleum engineer.

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- All the seal is accomplished in one sealing element!
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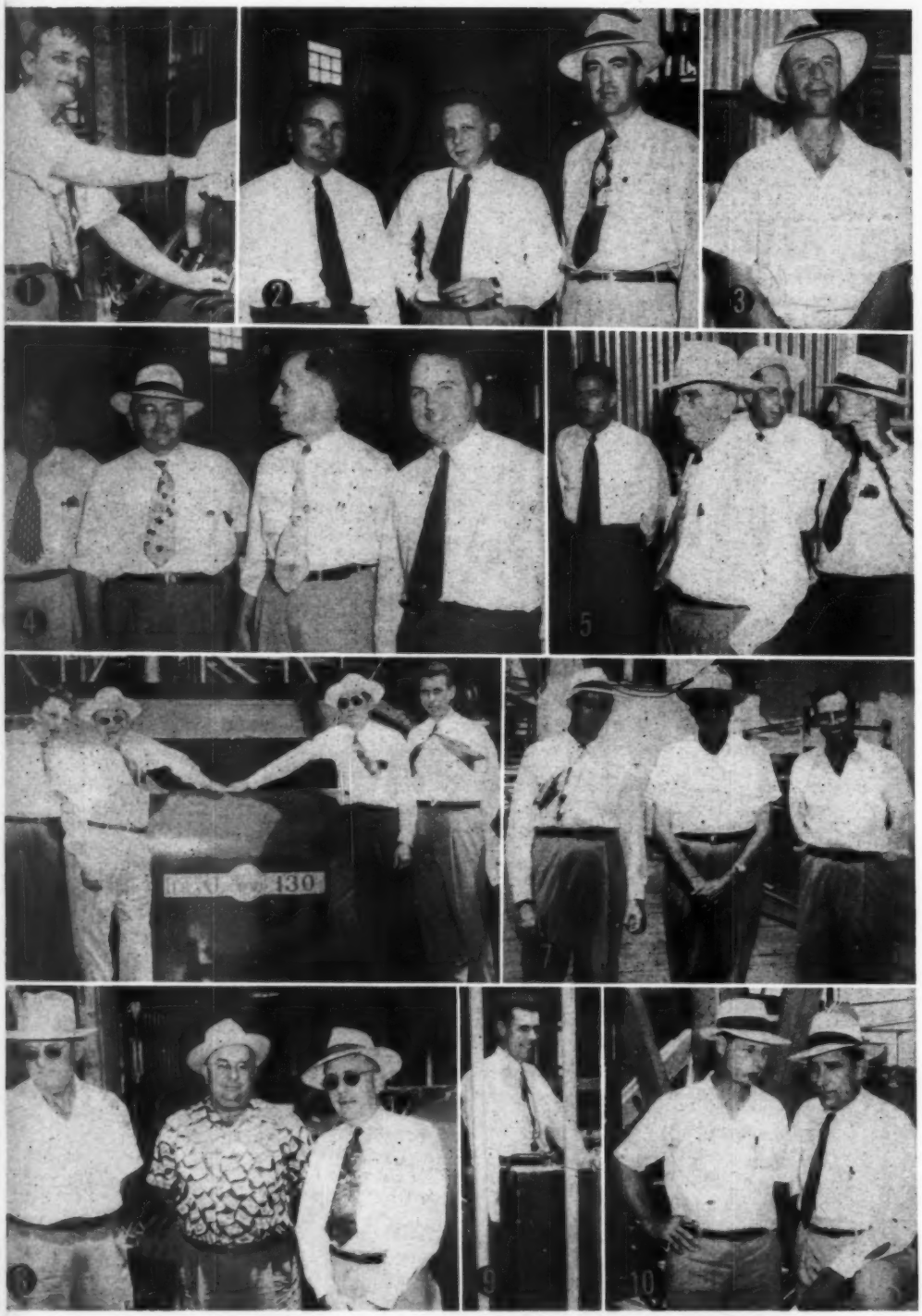
REMEMBER, THERE IS AN AMERICAN IRON SERVICE MAN IN EVERY ACTIVE FIELD

Among Those Inspecting Texaco's New Barge Drilling Unit



1. Spencer Rowan, equipment engineer, The Texas Co., New Orleans, who designed the drilling equipment layout for the "Gibbens."

2. Tom Pennington and R. P. Kapp, with Humble Oil & Refining Co. at Houston; and Oneil Taylor, National Supply Co., Houston.

3. J. H. Gibbens, The Texas Co., Harvey, La.

4. J. A. Battle, Jr., New Orleans; H. L. Campbell, Houma; and J. L. Shea, Houma, all of The Texas Co., and Tom Pennington, Houston, Humble Oil & Refining Co.

5. L. C. Artis, The Hague; L. C. Becker, New Orleans; and A. C. Lay, New Orleans, all of Shell Oil Co., and C. C. Brush, National Supply Co., Houston.

6. J. A. Emery, Lafayette; Roy E. Bell, Fort Worth; E. M. Winans, Torrance, Calif.; and F. C. Stauffer, Harvey, La., all of National Supply Co.

7. Howard Franquez, W. S. Law, and Jack Taylor, all of Superior Oil Co., at Lafayette, La.

8. W. S. Law, Superior Oil Co., Lafayette, La.; M. M. Lindsay, Lindsay Drilling Co., Baton Rouge; and George W. Brown, Jr., Levingston Shipbuilding Co., Orange.

9. F. C. Stauffer, National Supply Co., Harvey.

10. O. H. Haunschild and Paul Mattingly, Levingston Shipbuilding Co., Orange.

MEMBERS of the drilling fraternity turned out in full force for the launching ceremonies for Texaco's newest drilling barge. The drilling barge J. H. Gibbens is the fourteenth unit in the company's Gulf Coast drilling-barge fleet. Launching ceremonies were held at Levingston Shipbuilding Co.'s Orange, Tex., yards where the Gibbens was built. An all-day barbecue and open house was held in conjunction with the launching.

Engineers, superintendents, and executives of major oil companies in the Gulf Coast area are shown in these photographs, as they examine the new barge. First hole for the Gibbens is Texaco's 33-1 Bay St. Elaine, Terrebonne Parish, Louisiana. Barges play an active part in this coastal area.

Submersible Drill Barges-

The Texas Company drill barge "Rhodes" on location in South Louisiana. The drill barge "Gibbens", also built by Levingston for The Texas Company, is featured on Page 72 of this issue.

"A COMPLETE PACKAGE"

BY

Levingston

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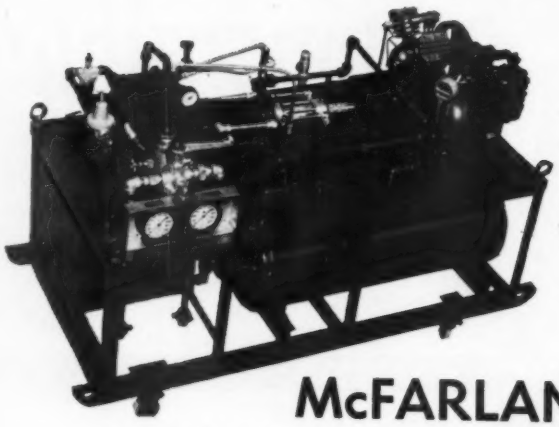


The Texas Company's new drilling barge "Gibbens" is equipped with a custom-built McFarland Unit for closing the blowout preventers.

McFARLAND BLOWOUT PREVENTER OPERATING UNIT

Slams the gate on Blowouts!

With the opening of a small valve, the McFarland Blowout Preventer Operating Unit instantly closes your pressure-operated blowout preventer to save your investment in equipment and hole drilled.

These Units are custom-built to your rig requirements. The McFarland Pump will deliver any desired pressure up to 20,000 lbs. in a range of ratios of input pressure to discharge pressure of 4 to 1 to 560 to 1. Operated by air, gas or water the Pumps are entirely automatic and maintain any selected pressure without attendance.

Write for complete details on this revolutionary pump that makes blowout preventers really prevent.

McFARLAND

Texaco's Drilling Barge

(Continued from page 74)

communication. Marine-type shipboard cable is used throughout for electric wiring.

Major Machinery and Equipment

The major items of machinery and equipment installed on the Gibbens are as follows:

Draw works: National Supply Co., Ideal Type 130.

Engine drive group: National Supply Co., of special design for barge mounting, consisting of three Superior PTD-8 diesel engines, 8½ by 10½ in., rated for intermittent service at 460 hp. at 900 r.p.m., and Ideal Gyrol fluid drives which are mounted on the drive group between the diesel engines and the rig drive.

Two slush pumps: Bethlehem G-600, 7¾ by 18-in., rater 600 b.hp. at 55 r.p.m., with chain drive from engine drive group.

Mud-mixing pump: Bethlehem GD-225, 7½ by 14-in., rater 225 b.hp. at 50 r.p.m., driven by General Motors Model 6031-C single oilfield power unit.

Swivel: Bethlehem 300-TA, rated 300 tons capacity at 100 r.p.m.

Traveling block: Regan 120, 60-in., 6-sheave, rated 500 tons.

Two rig service pumps: Oil Well Supply Co. 6P-LD, 5 by 6-in., driven by Louis Allis 15-hp., 1,200-r.p.m., explosionproof, 220 volts, 3-phase, 60-cycle motors.

Two engine-cooling pumps: Fairbanks-Morse Pomona turbine type with 16½ by 10-in. surface line, 12 KMC single-stage pump bowl assembly, driven by General Electric explosionproof VHS 15-hp., 220-440-volt, 3-phase, 60-cycle motors.

Two fuel-oil transfer pumps: Worthington Model 2 GAU, driven by General Electric ½-hp., 1,725-r.p.m., explosionproof, 208-volt, 3-phase, 60-cycle motors.

Blowout-preventer pump: McFarland 6 by 5¼ by 6-B1½ with 1-in. air regulator lubricator and relief valve set 5,000 psi.

Crown block: Regan Type EH, 600 T, seven sheaves (60-in.) grooved for 1⅜-in. line with catline attachment, clamp, and coring block.

Coring reel: Ideco MCR-15000, driven by General Motors 71 Single 6 power unit.

Shale shaker: Hutchinson Model 4860-C Rhumba, galvanized, driven by a General Electric Type K-225, 3 hp., 1,800-r.p.m. explosionproof, 208-volt, 3-phase motor.

Hook: Byron Jackson 4300 super triplex, 300 tons.

Two starting air compressors: Ingersoll-Rand Model H64D-9, 6 and 3½ by 5-in., speed 510 r.p.m., piston displacement 41 cu. ft. per minute, 30.1 free air capacity, 250 psig. discharge pressure, driven by General Electric 10-hp., explosionproof, 208-volt, 3 phase, 60-cycle motors.

Dynamic brake and motor-generator set: (d.c. current used by the dynamic brake) General Electric two-unit (Class 1, Group D) a.c.-d.c. motor generator set, consisting:

One Type CD-66, 7½-kw., 125-volt, 1,800-r.p.m. shunt-wound d.c. generator.

One Type K, 326-frame, 15-hp., 1,800-r.p.m., 208-volt, 3-phase, 60-cycle motor; complete with instruments and field rheostat.

Power slips: Abegg & Reinhold (Varco).

Bug blower: One Garret twin adjustable, 40-in. propellers. Three Garret single adjustable, 40-in. propellers.

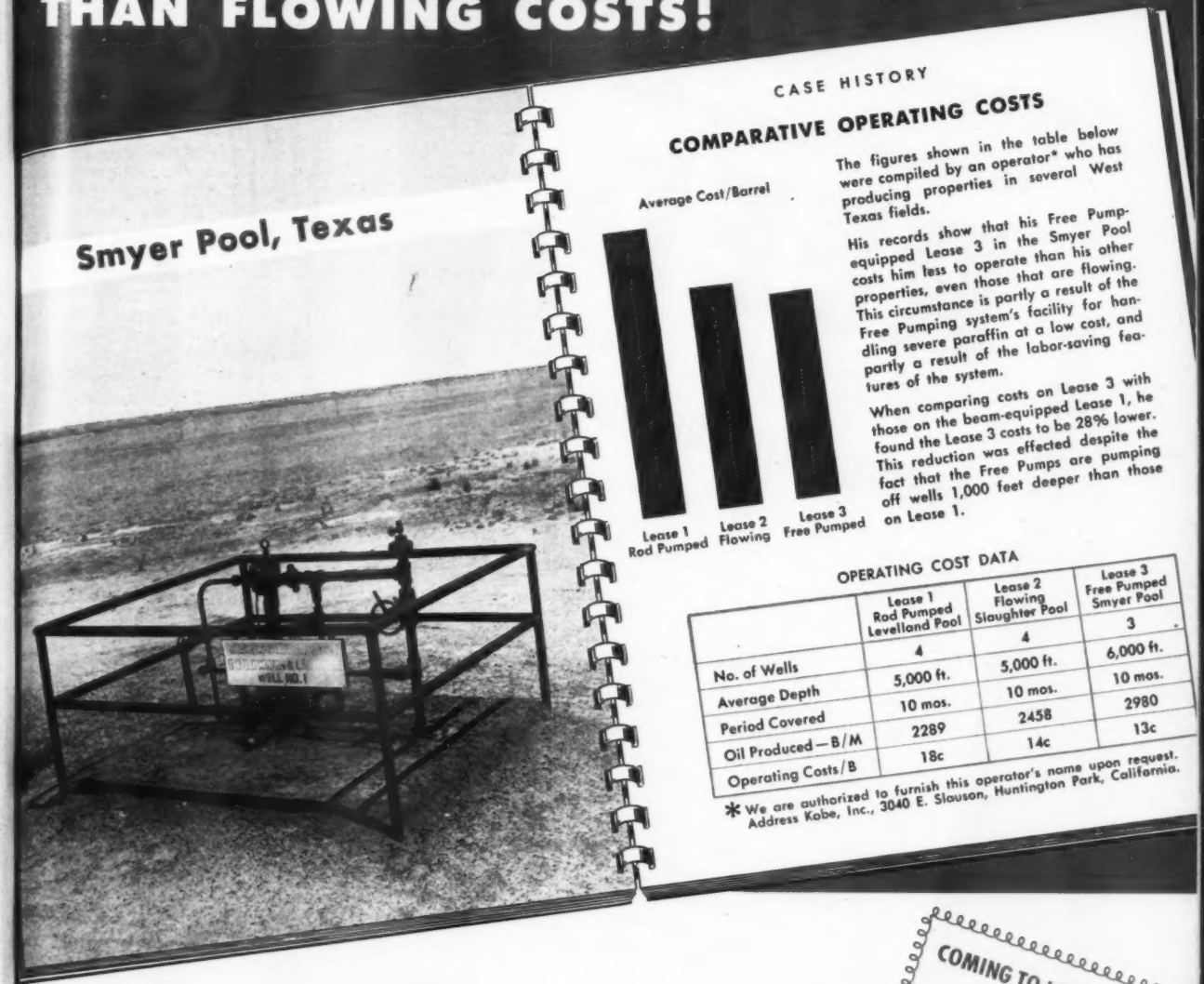
Rotary hose: One U. S. Rubber Co. matchless 3-in. by 60-ft. rubber hose. One Chiksan 4-in. by 60-ft., 9-joint steel hose.

Derrick: Lee C. Moore Corp., 140 ft. in height, 30-ft. square base with 7-ft. 6-in. top opening, designed for an A.P.I. column load capacity of 1,100,000 lb. and an indicated wind load of 135 m.p.h. with drill pipe stacked in the derrick.

Two electric generator sets: Westinghouse 75-kw., 0.8 power factor, Type G generators, 3-phase, 60-cycle, 120/208-volt, 4-wire, 1,200-r.p.m., 2-bearing, damper winding and explosionproof-resisting exciter, top mounted, driven by metallized belt from split sheave on rear shaft extension of generator, powered by two G.M. 60-30-C diesel engines.

West Texas Operator* finds

Free Pumping COSTS ARE LOWER THAN FLOWING COSTS!


Smyer Pool, Texas
CASE HISTORY
COMPARATIVE OPERATING COSTS
Average Cost/Barrel
Lease 1 Rod Pumped
Lease 2 Flowing
Lease 3 Free Pumped
The figures shown in the table below were compiled by an operator* who has producing properties in several West Texas fields.
His records show that his Free Pump-equipped Lease 3 in the Smyer Pool costs him less to operate than his other properties, even those that are flowing. This circumstance is partly a result of the Free Pumping system's facility for handling severe paraffin at a low cost, and partly a result of the labor-saving features of the system.
When comparing costs on Lease 3 with those on the beam-equipped Lease 1, he found the Lease 3 costs to be 28% lower. This reduction was effected despite the fact that the Free Pumps are pumping off wells 1,000 feet deeper than those on Lease 1.
OPERATING COST DATA

	Lease 1 Rod Pumped Levelland Pool	Lease 2 Flowing Slaughter Pool	Lease 3 Free Pumped Smyer Pool
No. of Wells	4	4	3
Average Depth	5,000 ft.	5,000 ft.	6,000 ft.
Period Covered	10 mos.	10 mos.	10 mos.
Oil Produced—B/M	2289	2458	2980
Operating Costs/B	18c	14c	13c

* We are authorized to furnish this operator's name upon request. Address Kobe, Inc., 3040 E. Slauson, Huntington Park, California.

In every major producing area operators are learning that you can't afford to overlook the operating economies offered by the Free Pumping system in selecting well pumping equipment.

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2. The system offers the greatest possible flexibility in handling production problems.
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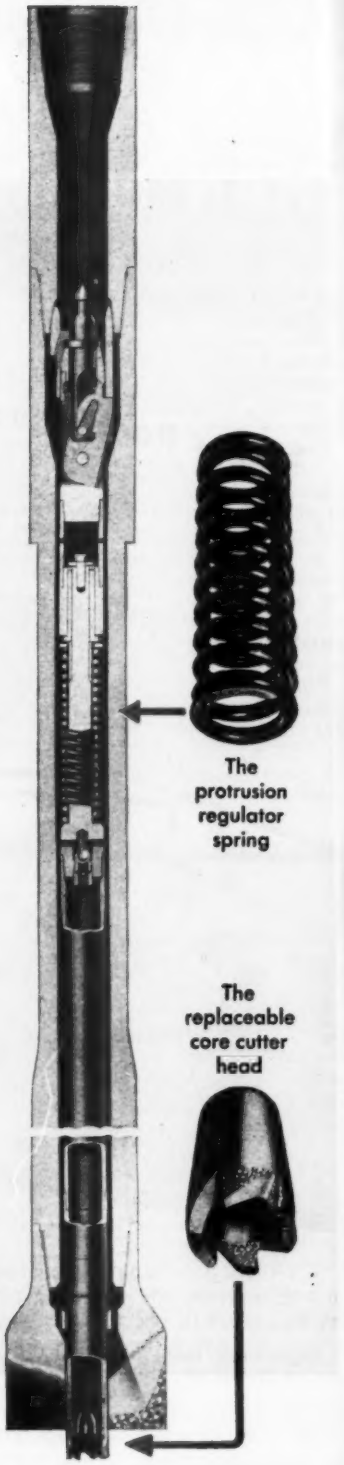

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New Plug Seal Nipple Makes Possible Simplified, Economical Christmas Trees

by Jay P. Gould

SIMPLIFIED, more economical christmas trees, in which control valves can be removed at will without the necessity for killing the well, recently have made their appearance at several flowing wells in California fields.

The new well-head hookups, some of which include casing heads containing provisions for easy running of instruments into the annulus under pressure, were made possible by a patented device known as a "Cosasco" Scotch nipple. Before taking up these new applications, however, a brief discussion of the nipple's design and principle of operation is in order.

Fig. 1, showing nipples in open (to pressure) and closed positions, illustrates the plug-seal principle involved. In Fig. 1A (closed position) it will be noted that as long as the gage carrier plug is screwed in completely, packing on the tapered face of the plug effects a complete seal against the tapered seat of the nipple.

When it is desired that pressure be obtained a gage is inserted in the carrier plug. Then by backing off the carrier plug only one-half turn or less, the seat of the carrier plug is backed away from the seat in the nipple. In this way, as shown in Fig. 1B, pressure is permitted to pass into the small ports at the base of the plug, between the packing and the O-ring, and into the bore connecting to the pressure gage.

Thus the device makes possible the obtaining of well pressures without the use of a valve in the hookup. The plug may be left in an open position at all times, for when in this position the O-ring effects the seal. When open, pressure reaches the gage but there is no flow of fluid or gas, which is highly desirable from the safety viewpoint. Whether open or closed, however, no pressure or fluid can make its way to the working parts of the nipple.

Purpose of the A.P.I. line-pipe thread on the outlet side of the nipple is to make possible the removal of the carrier plug while pressure is still behind the plug. For example, it may be that entry is desired into the tubing or casing of the well, or it may be desirable that the nipple be changed over from a means of obtaining pressure to one of straight flow. Whatever the reason for desiring entry, it can be gained through installation of a round opening valve on the outlet side and use of a special high-pressure lubricator. Main parts of this lubricator, shown in a collapsed position, are illustrated in Fig. 2.

After the valve and attached lubricator (the latter having been previ-

Left: First installation in which a nipple was used to make possible the running of instruments in the casing annulus. The derrick had just been skidded off and the well was still in the process of completion when this photograph was taken. When placed on production, a nipple replaced the swabbing valve and the valve on the tubing head was removed so that only the master valve was left in place. A diagram of the completed hookup is shown in Fig. 5.

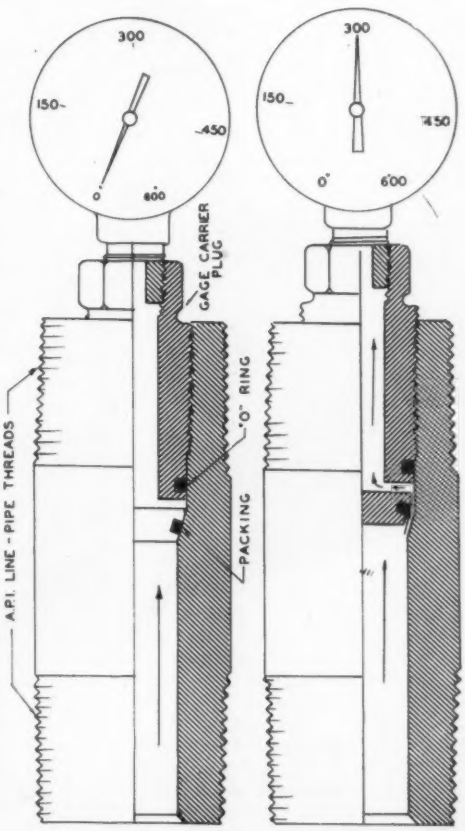

Fig. 1A: It will be noted that as long as the carrier plug is screwed in completely, a seal is provided by the packing. Fig. 1B: With the carrier plug backed off one-half turn, the O-ring effects the seal which prevents pressure from reaching the inner threads.

Fig. 1A *Fig. 1B*

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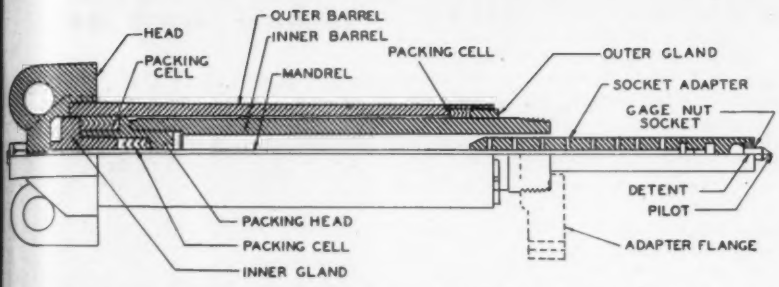


Fig. 2—Lubricator, shown in collapsed position, is employed in removing or replacing carrier plugs and seat protectors. Its design permits this work to be carried on against full well pressures.

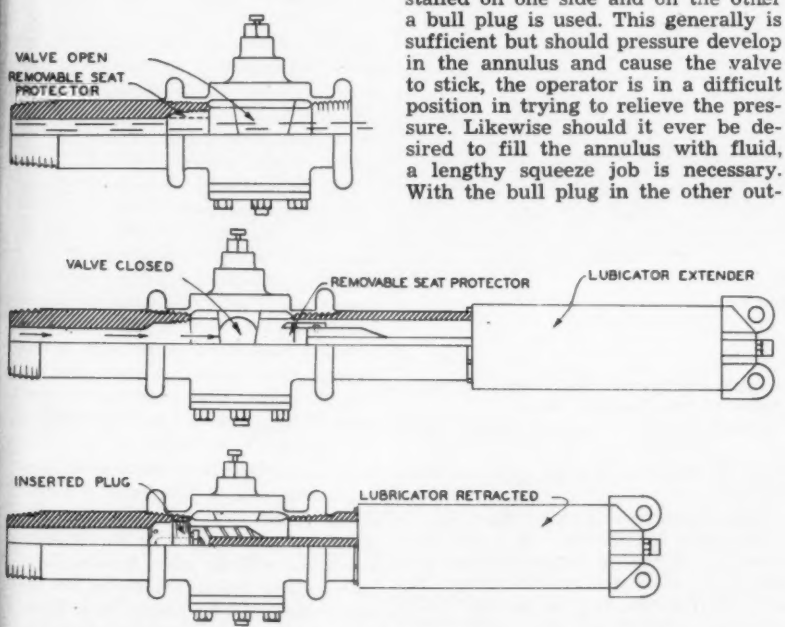
ously adjusted as to its length of reach) are in place on the outlet side of the nipple, the lubricator is pushed in until engagement is made with the pilot, detent, and gage socket nut. With this done, the lubricator is rotated in a left-hand manner to remove the gage carrier plug. As the carrier plug is unseated and removed, pressure which is behind the plug is permitted to pass through the valve and into the lubricator where a balance is maintained between the mandrel and the inner and outer cylinders.

After the plug is pulled past the center of the open valve, the latter then may be closed and the lubricator removed. In most applications of Scotch nipples, however, whenever the carrier plug is removed it is replaced by a seat protector. In installing these seat protectors, or in replacing a gage carrier plug, a reverse procedure is followed with the lubricator; i.e., the protector or plug is installed on the extended lubricator, and then it is pushed in and seated in the nipple. Three steps in the procedure of replacing a seat protector with a carrier plug are shown in Fig. 3.

Applications of New Tool

From this limited discussion of how the Scotch nipples operate, it is readily apparent that they are highly applicable in the surface controls of flowing wells. In following paragraphs a few of these applications will be described.

Application to casing heads.—Normally in providing surface connections to casing heads, a valve is installed on one side and on the other a bull plug is used. This generally is sufficient but should pressure develop in the annulus and cause the valve to stick, the operator is in a difficult position in trying to relieve the pressure. Likewise should it ever be desired to fill the annulus with fluid, a lengthy squeeze job is necessary. With the bull plug in the other outlet, no way is present to bleed while the filling job is in progress.



Figs. 3A, B, and C—Steps in the use of the lubricator as a valve reinstallation tool are shown here. In Fig. 3A (top) a seat protector is in place so that flow is permitted through a valve which is assumed to be in need of replacement. Fig. 3B (center) shows the step after the seat protector has been pulled through the valve. With the valve closed the lubricator can be disengaged and the seat protector removed. Fig. 3C (bottom) shows a gage carrier plug installed in the nipple, after being pushed into place and installed by the lubricator. With flow cut off, the valve can be removed and the reverse procedure followed to place a new valve in service.

Placing Scotch nipples in at least one of the casing-head outlets makes it possible to enter the annulus at any time. Also, instead of having one or two valves in this use on each and every well, only one full-opening valve is required. This can be kept in the shop, and can be tested before it is taken to the well to insure it is in perfect working order.

In Ventura Avenue field, where surface pressures as high as 7,000 psi. are not uncommon, it is usual practice to keep a column of mud in the casing annulus as a precaution against blowouts. From time to time additional mud must be introduced to replace that which has been lost. Because of the ready access they provide into the annulus, the new nipples have been especially helpful in this use.

Where cellars are used, placing the casing head or casing-head spool below ground level, screw nipples of the elbow type are used. This is necessary in order that the valve can be installed and the lubricator manipulated whenever a carrier plug is to be installed or removed. The elbow-type nipples are faced in the upward position, as shown in the accompanying photograph, or are directed towards one corner of the cellar. The nipples, being rigidly built (and of 10,000-psi. test pressure), are not likely to fail because of a

The Author

Jay Gould, who holds the basic patents on the new "nipple" and lubricator described in the accompanying article, has been associated with the oil industry in various engineering positions for almost 20 years. Graduating from a Tulsa high school he obtained a B.S. degree in mechanical engineering at University of Missouri in 1930 and in 1931 took special work in petroleum production engineering at Baylor University. In succeeding years he worked with his father in the field of positive-displacement oil meters, was chief engineer for K. T. Norris of Los Angeles in charge of drilling and producing, and in 1946 and 1947 was a sales engineer for Baash-Ross Tool Co., specializing in well-head equipment. Last October he returned to the United States following 2 years in the Middle East as chief drilling and production engineer for Iraq Petroleum Co., Ltd. Gould currently is living in La Canada, near Los Angeles, where he has established his firm, Corona Oil Specialties & Service Co.

XUM

falling object striking them since there is no added weight constantly bearing down on the outer end of the nipple.

Use in christmas trees.—The average California two-ring christmas tree is completed much as shown in Fig. 4A; that is with a master valve, cross, swabbing valve, two wing valves, and two flow beans. By using flange and hammer-union type Scotch nipples, one wing of the tree and the swabbing valve are removed completely as is shown in Fig. 4B. Any time the flow-line valve requires replacement the seat protector can be replaced with a carrier plug, etc., as explained earlier in the method of employing the lubricator. Should a second arm be necessary the reverse procedure can be applied.

In place of the swabbing valve a hammer - union - type Scotch nipple, having the same full bore of the tubing, is used. Easy access to the tubing is had through installing the female half of the hammer union, together with the wing nut, on the inlet side of a full-opening valve and then removing the gage carrier plug. Thus the necessity for a swabbing valve on each well is eliminated.

Where tubing heads are used, one valve can be replaced in a manner similar to the above application in christmas trees. If the single valve used in the Scotch-nipple assembly starts leaking, or needs replacement for any reason, this is easily done under pressure with the special lubricator. On conventionally equipped wells where no tubing packer is run, pressure in the annulus is against the wing valves at all times. Should these start to leak there is no way for the operator to remove the faulty valve without first killing the well.

Annular application.—A more recent use of Scotch nipples is to provide access to the annular space so that instruments can be run to check flowing conditions in wells not equipped with tubing packers. Fig. 5 shows the hookup devised by one California engineer; the accompanying photograph shows the first installation.

Many California operators do not run tubing packers and suspend the tubing by screwing it into the flange

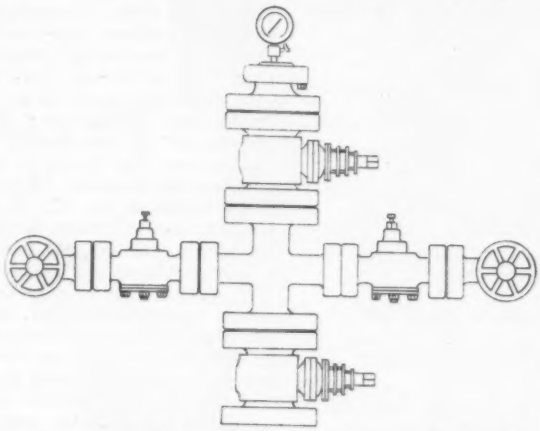


Fig. 4A—General arrangement of a two-wing christmas tree, using flanged fittings, as installed on many California wells.

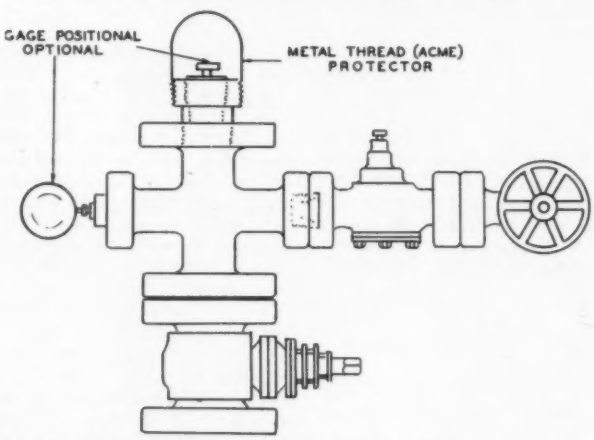


Fig. 4B—With Scotch nipples, one flow wing and the swabbing valve have been completely eliminated. Height of the christmas tree is substantially lowered.

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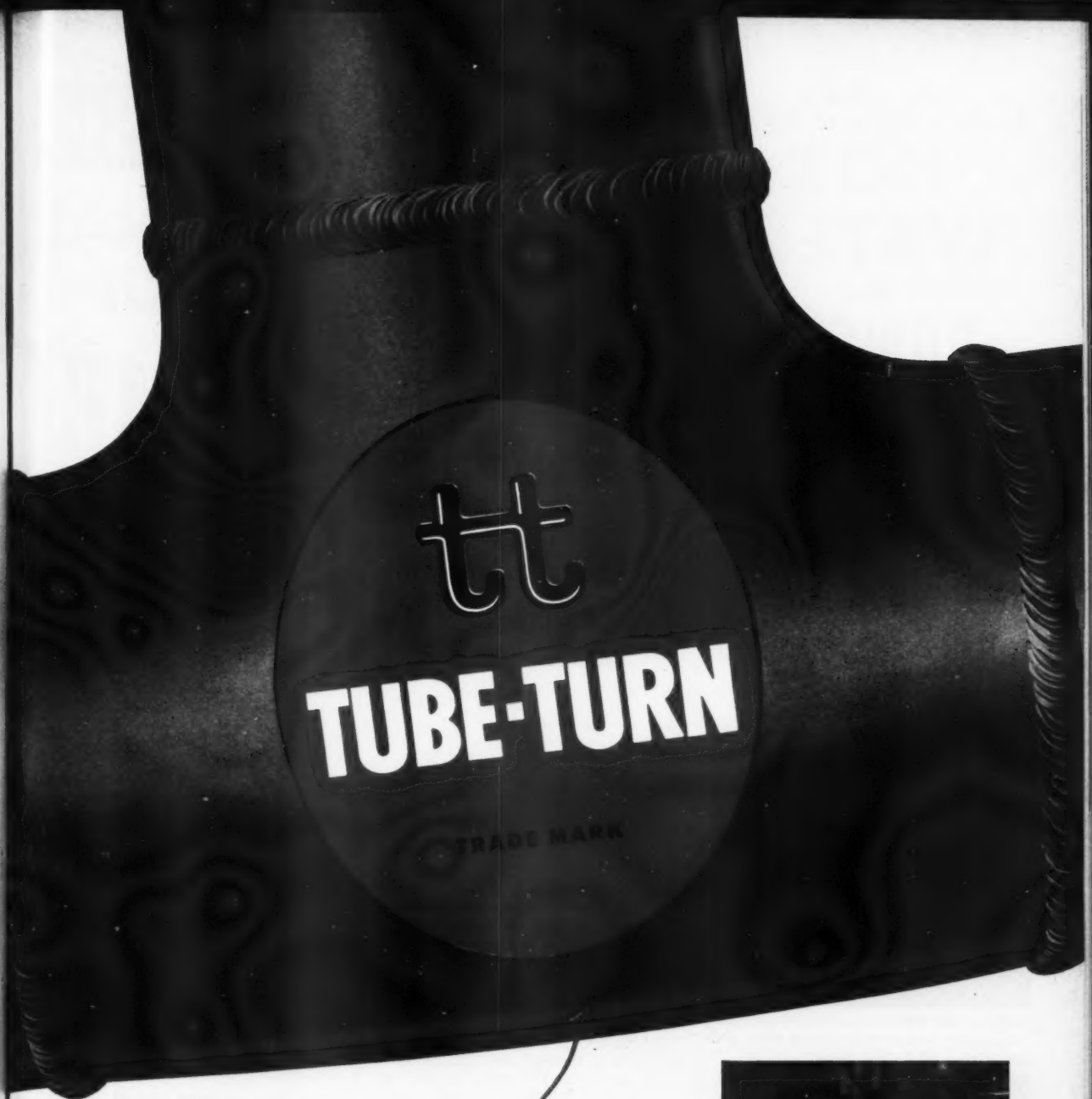

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which rests on top of the tubing head. Due to the size and close proximity of the master valve to the top flange, as long as the former is in place instruments cannot be introduced into the casing annulus. Only when the wells have stopped flowing and the

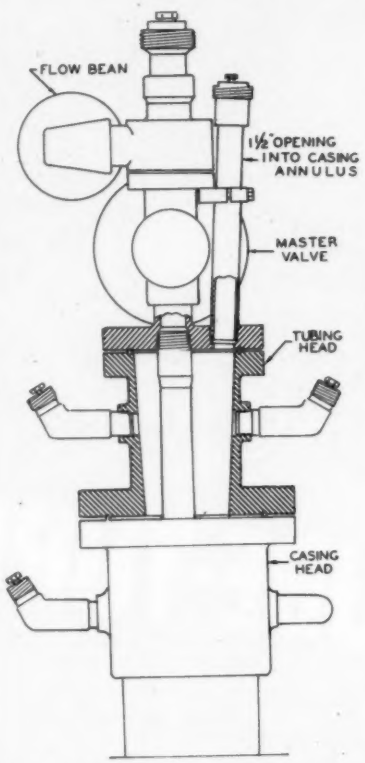

Fig. 5—Detailed drawing of well-head hookup in which Scotch nipples are installed. To assure safer running and withdrawal of instruments, tubing is suspended slightly off-center.

master valve no longer required has this been possible.

As shown in Fig. 5 a 1½-in. hole was drilled through the flange, at an angle equal to the slope of the inside wall of the tubing head, and a short length of threaded pipe screwed into the opening. On the outer end of the head a hammer-union Scotch nipple of the type used in replacing the swabbing valve is installed. To gain more freedom in passing instruments in and out of the opening, center line of the tubing was moved $\frac{1}{8}$ in. off center line. This still left $1\frac{1}{16}$ in. on the side of the tubing nearest the inside wall of the casing. This meant that 1¼-in. o.d. instruments have ample room to move on the short ($1\frac{1}{16}$-in.) side without the danger of hanging up. Even at the collar 1 11/32 in. of space are maintained on the short side.

With this arrangement it is possible for the operator to run instruments into the casing annulus without fear of damage or loss of the instruments, or of losing control of the well.

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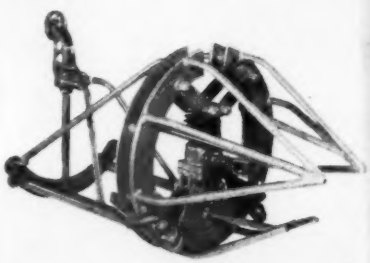

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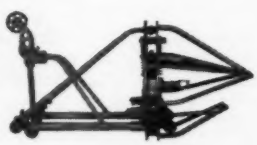

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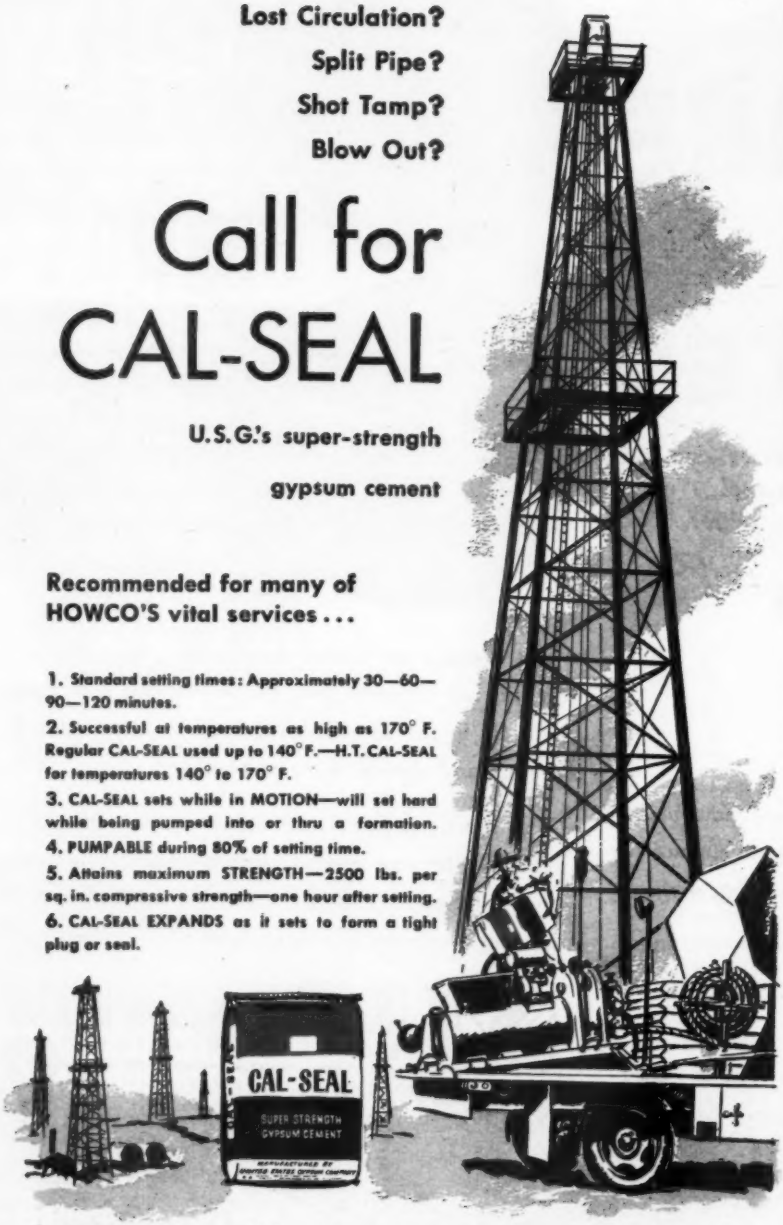

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Increased Oil Recovery From Injection Operations

(Continued from page 70)

tion while a reservoir is still moderately productive enables the operator to obtain the bulk of his gas requirements from production. This procedure, employed in a part of the Bartlesville sand reservoir at Glenn pool,[7] the oldest major Oklahoma field, enabled the operators of a cooperative project to increase their producing rate more than two and one-half times in the course of 2 years (see Fig. 5).

Another Bartlesville sand operation, in Delaware-Childers field[8] of Oklahoma, consists of some 28 independent injection projects embracing 80 per cent of the productive area. Gas injection was initiated in 1924 after the field producing rate had declined to less than 1,000 bbl. per day, the peak rate for the field having been 13,000 bbl. per day.

During the years following, rates were increased to a maximum of 3,500 bbl. per day and at the end of 1947, were still being maintained at six times the rates predicted for that date in the absence of injection. This is graphically illustrated on Fig. 5. Oil production since 1924 is estimated at over 15 million barrels more than the amount that would have been obtained by a continuation of primary methods, with an estimated 10 million barrels yet to be recovered by continued injection. Since the field would now be nearing abandonment without injection, the total expected gain represents a 100 per cent increase in ultimate yield.

West Pampa, Texas Panhandle

That gas repressuring is applicable to other than sand formations is illustrated by the short history of one of the largest cooperative gas-injection projects of its kind in existence, now being pursued in the Panhandle brown dolomite formation of West Pampa field[9] in Texas. West Pampa wells, originally completed in the 1920's with initial capacities of the order of 500 bbl. per day, had declined to an average capacity of 12 bbl. per day by the time injection began in 1946.

Although it took more than a year of experiment and well conditioning to bring about an upturn in the decline, rates had been stabilized at the 12,000-bbl. per day level by mid-1949, as shown on Fig. 6, almost twice the rate that would now be obtained had former operations been permitted to continue. A particular feature of this operation is recovery from the natural gas of liquid gasoline, butane, and propane, which by the end of 1948 amounted to 1,000 bbl. per day.

Other Examples

Additional examples of maintenance of producing rate by gas injection are provided by operations in North Burbank pool in Oklahoma and Cedar

Lake field in Gaines County, Texas, both projects graphically illustrated on Fig. 6. In North Burbank,[8,9] the field-wide cooperative injection project initiated in 1933 had successfully supported producing rate without decline for over 15 years by the end of 1947. Recently the entire field was unitized to permit water flooding. As a result it is estimated that ultimate oil recovery may be doubled.

The Cedar Lake[7,9] project was initiated comparatively early in the life of the San Andres limestone reservoir, low initial well capacities and a rapid decline in reservoir pressure and productivity having indicated that primary production revenue would fall below operating costs by the time 3 to 5 per cent of the oil in place had been recovered. By gas injection, reservoir pressures have been supported near 600 psi. and average well capacity at a level 40 per cent higher than would now exist, despite the fact that the project is limited to only about half of the field. An effort is currently being made to unitize Cedar Lake for field-wide injection. Further increases are expected if this is successful.

Cedar Lake is an example of a pressure-maintenance operation, a technique particularly advantageous in deep pools. The high working pressures characteristic of deep reservoirs would require the handling of immense volumes of gas, most of which would have to be purchased, in order to achieve the desired results if repressuring was delayed until late in field life. It is thus advantageous to begin early and return as much as possible of the produced gas to the formation in order to conserve the natural pressure which originally exists.

Since produced gas alone cannot always provide the greatest possible degree of pressure maintenance, it is frequently supplemented by purchased gas or water. Two projects of this type (see Fig. 7) provide good examples of the support of producing rate possible by pressure maintenance.

Unitized gas pressure maintenance in a sand reservoir of Schuler field,[10] Union County, Arkansas, supported reservoir pressure at the level existing before injection began, and subsequent water injection caused pressures to rise. As a result, producing capacity has been supported well above the allowable rate of 9,000 bbl. per day, permitting the maximum return compatible with state regulation. Similar results were obtained in Haynesville pool[11] in Louisiana where, although pressure decline was retarded rather than halted, the experimentation and control made possible by unitized operations have enabled the operator to increase producing rates. At the present time the field is producing at its maximum rate for the first time since 1944. Support of producers, royalty owners, and state reg-

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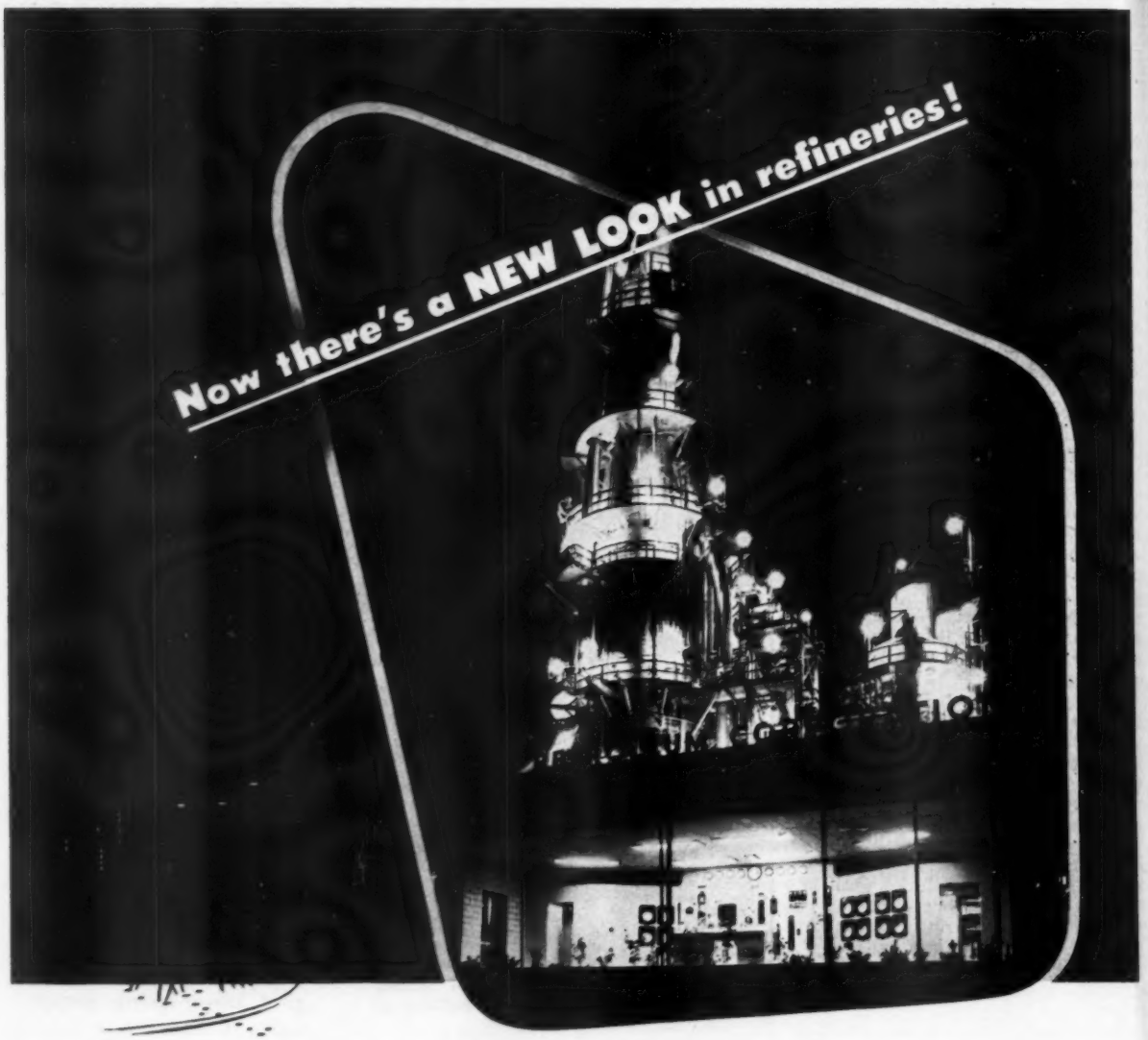

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ulatory authorities made these projects possible.

An outstanding illustration of the benefits in increased ultimate recovery and producing rate that can be obtained from pools at great depth is the performance of the Miller Three Zone Unit, 8,500 ft. below the surface, in West Tepetate field,[12] Louisiana. Estimates established by early information indicated that the ultimate recovery from this pool would be about 3.7 million barrels by natural means, and pressure maintenance was initiated immediately. By mid-1949, the zone had already produced more than the primary expectation, and instead of being abandoned, was still producing at 75 per cent of its peak production rate, as illustrated by Fig. 7. Here again support of royalty owners, producers, and state authorities was a prerequisite.

New Hope and Midway

Although they do not involve gas injection, no review of pressure-maintenance operations would be complete without reference to the excellent results obtained with water alone in the limestone reservoirs of New Hope field[13] in Texas and Midway field[14] in Arkansas as illustrated by Fig. 8. During primary operations at New Hope, reservoir pressures declined rapidly, the field's producing rate declined despite addition of new wells, and by 1946, all wells in the field required pumping. A reservoir pressure increase of 500 psi., obtained by water injection, not only tripled average well capacity and field producing rate, but also restored 20 of the 28 wells in the field to flowing production.

At Midway, primary producing performance was such that the field was scheduled for severe restriction of its allowable producing rate by the state regulatory body. Pressure maintenance by water injection enabled the operators to satisfy the authorities that curtailment was not necessary in the interests of efficient production, and the producing rate has been maintained at about 175 bbl. per day per well since the project was initiated.

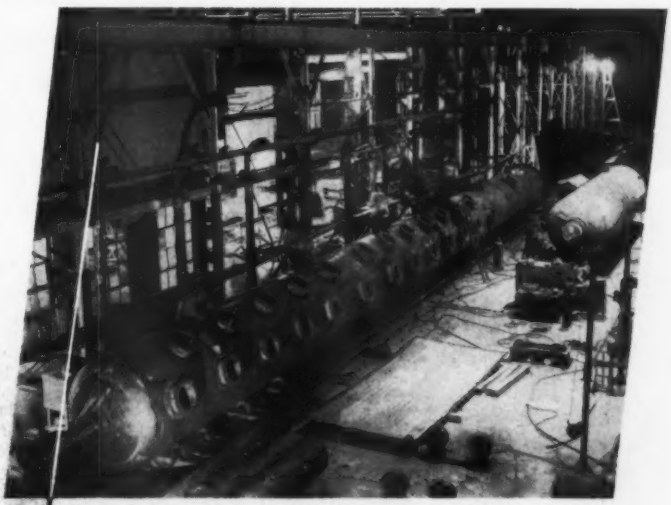
The results of these water-injection projects are of particular interest to those studying gas-injection since, in many instances, water injection may be inaugurated in units after all benefits possible by gas injection have been realized, or as a supplement to gas injection. Gas injection may be employed first because (1) gas is conserved, (2) addition of facilities to recover liquids from gas is then more attractive financially, (3) susceptibility of the reservoir to injection is more readily determined, and (4) adequate water supply is more difficult to develop.

The examples of field performance discussed herein serve to demonstrate the effect of injection on performance. In addition to this conclusive evidence, the following discussion of the fundamental physical and mechanical characteristics of depletion-type pools further confirms the potentialities of injection practices.

Oil is commonly found associated with water and gas in the porous rock which constitutes an oil reservoir, under pressures roughly equivalent to ½ psi. for each foot of depth below the surface. Thus, a pool at 5,000 ft. would be expected to have a pressure of 2,500 psi. before production begins. This pressure has two effects in the reservoir.

1. Pressure constitutes the force, or energy, which moves the oil to the well bore. The rate at which the oil moves and is produced is proportional to the pressure. As oil and gas (and possibly water) are withdrawn, the pressure declines and the producing rate also declines.

2. Pressure controls the solubility of gas in oil. The gas is usually dissolved in the oil before production begins, and remains dissolved until the pressure drops to a level at which gas can escape from solution and exist in the free state. A comparatively small amount of production is obtained before this point is reached. Thereafter, gas continues to separate as the pressure is reduced, part of it



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moving independently to the well bore with oil, and part of it remaining in the pore space to take the place of the oil and dissolved gas that are produced.

No oil can be produced unless its place in the reservoir is filled by another fluid. In some cases, the fluid is water which flows into the pool from the bottom or edge. In most cases the displacing fluid is gas coming from solution in the oil. As the proportion of pore space occupied by free gas increases, the movement of oil is impeded, contributing to the decline in producing rate.

The diagrams on Fig. 9 illustrate the effect of pressure on producing rates and fluid distribution for a typical case, involving a depletion-type reservoir producing by primary methods from a depth of 5,000 ft. In the first stage, producing rate decline accompanies a decline of pressure to 1,350 psi., a level near that at which free gas will be released in the reservoir to occupy space left by the oil removed. At that point the operator may install a pump having a capacity of, say, 350 bbl. per day. The well can produce at a level rate of 350 bbl. per day until a pressure of 700 psi. is reached. At that point, pressure decline and gas interference combine to cause a further reduction in producing rate, since oil can no longer enter the well bore fast enough to satisfy the pump. This decline reaches a capacity of 10 bbl. per day at 100 psi. At that level the well is nearing the end of its economic life.

Concurrently with the decline in production the relationships of the fluids in the reservoir undergo the illustrated changes under control of measurable expansion and gas solubility characteristics. The water content, commonly called irreducible or "connate" water, is immobile, or nearly so, and is distributed evenly through the pore structure. The oil and gas are also distributed evenly through the pore structure, the bulk content of each pore being similar to that shown for a barrel of reservoir space.

Before gas starts to escape from solution, that is, during the decline from 2,500 to 1,350 psi., only, 0.0069 bbl. of oil, or slightly more than 1 per cent of the oil in place would be withdrawn from each barrel of reservoir space. This amount is less than 5 per cent of the oil ultimately recovered. The bulk of the production, therefore, is obtained at reduced rates over a long period of time.

Since producing rate is dependent on pressure, it is apparent that if the final pressure in the illustration could be increased, the rate would also rise. In the hypothetical case presented, this benefit could be accomplished in each barrel of reservoir space by the compression and injection of 9.5 cu. ft. of gas for each 100 psi. pressure increase desired. The additional oil produced by an artificial increase in pressure would otherwise remain in the ground and be abandoned. A project of this type, which may take the form of a gas drive or of a repressuring operation, is sometimes able to return startling increases in ultimate recovery, particularly in reservoirs having a small amount of gas originally dissolved in the oil.

Artificial support of producing rates can begin at any time in the life of the reservoir. An early beginning has the additional benefit of maintaining a higher average producing rate, and depleting the field in a shorter time. A project of this type, generally taking the form of a pressure-maintenance operation, supports producing rates at a higher level during all phases of depletion, as well as producing more oil than would be possible by natural means.

Another benefit of pressure maintenance depends on the amount of reservoir space occupied by a given amount of oil and its dissolved gas. The original reservoir condition in the illustrations of Fig. 9 shows 0.64 bbl. of stock-tank oil filling 0.80 bbl. of reservoir space, because it has 320 cu. ft. of gas in solution. The depleted condition shows 0.50 stock-tank barrels of oil filling 0.55 bbl. of reservoir space. These relations are equivalent to saying that 1 bbl. of stock-tank oil will occupy 1.25 bbl. of space

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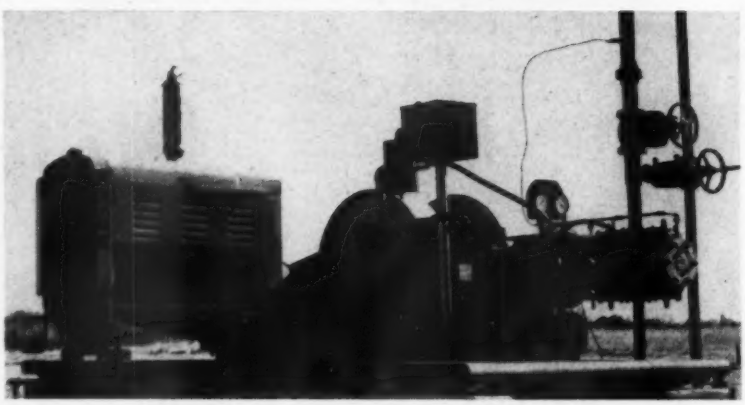

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in the reservoir at 2,500 psi. and 1.10 bbl. of space at 100 psi.

The shrinkage in reservoir space occupied as pressure declines is caused by gas separating from the oil. The proportion of pore space that must be occupied by oil when production ends is fixed by complex relations between the fluids and the rock. It is to our advantage to insure that that space is occupied by oil that has undergone a minimum of shrinkage. This end can be accomplished by pressure maintenance, preventing separation of gas from the oil.

The diagrams on Fig. 10 illustrate the final reservoir conditions associated with natural depletion, low-pressure gas injection, and pressure maintenance in the assumed example. The natural depletion situation is as described before. By supporting producing rates with injected gas at low pressure, economic production can be maintained until an additional 3 per cent of the pore space has been evacuated of oil, above that avoided by natural means, and an increased amount of oil can be recovered.

By pressure maintenance at 700 psi., producing rates can be supported at an economic level until the same proportion of the pore space has been evacuated of oil as could be voided by low-pressure gas injection. However, in this case, the oil remaining in the reservoir represents less stock-tank oil than that remaining after the 100-psi. operation because it has not been allowed to give up its gas.

If, after producing rates have become uneconomic at 700 psi., the pressure is allowed to decline and the gas to separate and flow out of the reservoir, the final volume of the residual oil after shrinkage, at the comparable 100-psi. level, will fill only 47 per cent of the pore space, as compared to 52 per cent remaining after low pressure and 55 per cent left after natural depletion.

The above discussion presents one example of the increase in oil yield possible by injection of gas. But oil reservoirs are like anything created by nature—no two are exactly alike. The increase that may be obtained in oil recovery by pressure maintenance from any field is dependent on the characteristics of the reservoir's fluids and rock and the artificial-recovery operation employed. Although water injection is generally considered more beneficial, fluid and rock characteristics, availability of gas, and other economic considerations often combine to make gas injection more applicable, initially, in most reservoirs.

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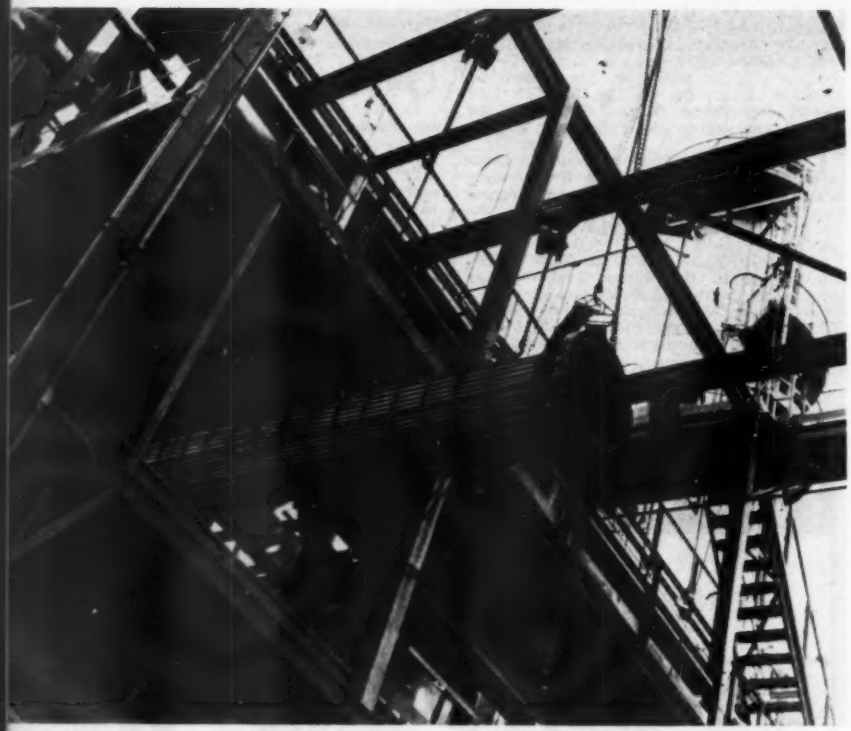

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Planning a Large Unit TURNAROUND

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by E. E. McPherson

PLANNING of large unit turnarounds in refineries begins well in advance of the actual shutdown date. The efficiency with which a turnaround is conducted depends upon careful planning, a thorough study of previous shutdowns, a well-trained worker group, on-the-job supervision, and close cooperation among the operating, maintenance, and inspection division supervisors and personnel.

About November of each year a tentative shutdown schedule for all units during the coming year is set up by Pure Oil Co. This schedule, of course, will have a lot to do with the planning arrangement of turnarounds. From time to time deviations from this schedule will have to be made for good reasons. With the original schedules in mind and deviations worked out as found necessary and all other contingencies taken into consideration, definite dates for the unit turnarounds are determined. Planning for unit shutdowns should get under way as soon as runs are started and continue over what amounts to the entire operating period. Organized planning should take place in this order:

1. General plant superintendent and division heads, along with a number of operating, maintenance, and other key people, meet for the purpose of reviewing the inspection report of the previous shutdown. This takes place soon after the beginning of the current run. By starting the planning at once it permits time for ordering materials and checking anticipated repairs as well as the fabrication of pipe work and providing other replacement items. This is for the purpose of having everything in complete readiness for the next turnaround.

E. E. McPherson is manager of Pure Oil Co.'s Heath refinery at Newark, Ohio. He has been associated with Pure for 30 years, and served as superintendent of the Heath plant from 1930 until 1948, when he was named manager. Prior to going with Pure, McPherson was engaged in refining operations with Empire Refineries, Inc., at Gainesville, Tex., and with Standard Oil Co. (Ind.), at Sugar Creek, Mo.

2. Operating division key people, about a week before a shutdown date, meet with the operating superintendent to discuss and screen work orders covering items that it will be necessary to take care of during the next scheduled turnaround. A continuous file of accumulated information is maintained in this division covering work to be done during the shutdown period.

In order that nothing of importance may be overlooked, a record is maintained in the control rooms and pump houses at the major units whereby operating personnel may list work items which they feel should be handled. These notes or requests are screened by the unit operating foremen before work orders are issued.

All equipment throughout the unit is placed on a scheduled cleaning or preventive maintenance list. Some exchangers, vessels, and other items are scheduled for cleaning during each turnaround; others are placed on an in-between schedule as experience has indicated. This schedule is subject to revision from time to time. Since repairs on pumps and other equipment are made while the unit is on stream where standbys are available, this type of work generally is not done during the turnaround.

3. Plant inspector with his assistants and others handling inspection work meet for the purpose of reviewing action taken on the previous turnaround, going over record information dealing with corrosion rates, reviewing previous inspection reports, preparing work orders, developing safety-valve inspection schedules, and outlining safety measures that must be observed during the turnaround.

4. Maintenance superintendent meets with his staff at which time work orders are prepared covering preventive maintenance deemed necessary as well as other work which originates with this division.

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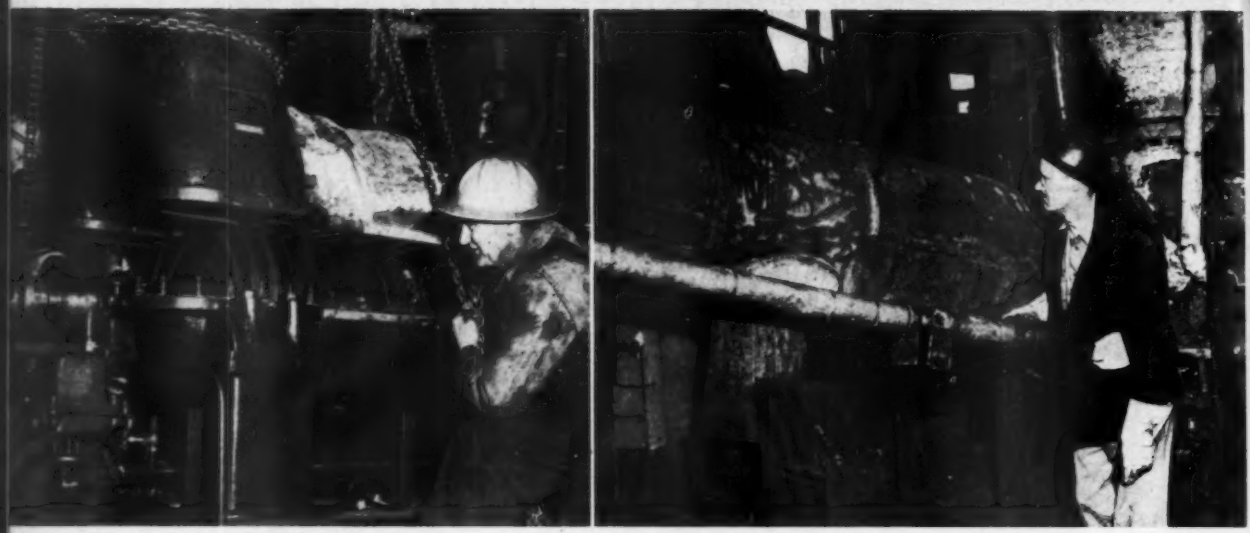
XUM



Left: A mechanic inspects the blading on the steam turbine which drives the blower at Pure's fluid catalytic cracking unit. Right: Operating foreman inspects welded repair to catalyst carrier line at the Health refinery catalytic cracker.

5. All division heads and a number of operating foremen meet with the general plant superintendent for the purpose of reviewing all of the work scheduled as a result of the various separate division meetings outlined previously. At this meeting final work plans are set up and approved.

6. Operating and maintenance division representatives get together at a desirable time for the purpose of setting up a shutdown schedule, paying particular attention to when any and all work must get under way. As a result of such a conference the exact hour of a unit shutdown is determined. A schedule is set up for each vessel, exchanger, tower, etc., as to the time each item of equipment may be opened for cleaning and inspection. Questions regarding work orders are discussed if necessary so that a clear understanding may be had by those most directly concerned.

7. Maintenance division supervisory people meet several days in advance of a scheduled shutdown date and plan the matter of manpower distribution. Prior to the turnaround date all maintenance tools are gone over carefully, repaired, cleaned, and oiled. All tools are moved to the job and placed at convenient locations. A tool wagon equipped with small-tool requirements is moved to the unit location. All prefabricated pipe and other replacement equipment is taken to the job site and placed where most convenient for use as required.

A great amount of study is given to the organization of the various work crews. Men are assigned work for which they are best suited. New and inexperienced men are placed with older men and not grouped together. Careful selection of lead men (handy-man classification) is necessary; that is, men regularly assigned to this classification with others temporarily upgraded are used. Because of the major job at hand, men of the classification mentioned play an important part in the work. In other words, supervisors in charge of jobs could not possibly look after all of the detail in carrying out the work in an efficient and safe manner without the assistance of the handy man.

8. As turnaround work progresses the general plant superintendent and maintenance-division supervisors meet at the close of each work day for the purpose of going over the work that has been accomplished to date and plans for the following day. Details are worked out here to coordinate the work of the various departments of the maintenance division so that one craft will not be delayed by another.

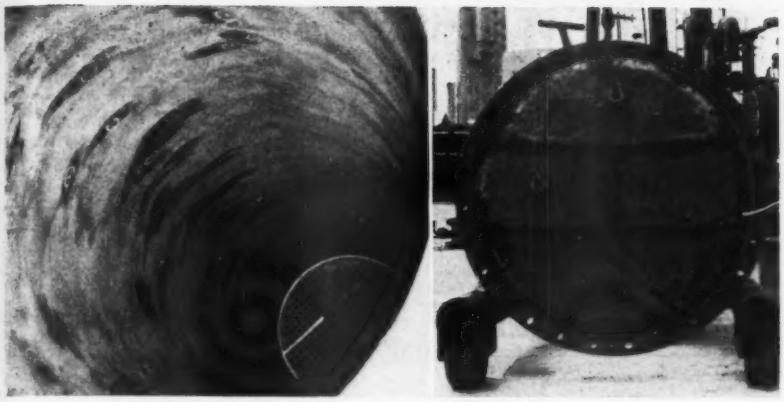
9. General inspector and his staff have an over-all interest in the turnaround from the beginning of the planning until the final testing is completed. A great deal of the work of this division takes place before the actual shutdown date. Then, too, the inspection division cooperates with all other divisions by keeping in constant contact with all jobs that are being carried on. By this contact an additional check is obtained to make certain that proper type of materials are being used and the standards are followed.

The inspection division makes it a point to check equipment which they suspect might require repairs even though previous inspection did not indicate such condition. In this manner plans may be made early during the turnaround to take care of any unpredicted work.

10. The operating division is naturally very much concerned about the turnaround work because everything that is going on is being done for them in order to complete the work on schedule and place the unit back in production. Some operating-division workers are used around the clock during the turnaround for the purpose of taking care of certain jobs that are required to do over the shutdown period, and then, too, these men are active in seeing that the various items of equipment are made available for the working crews according to schedule.

A go-between man is used chiefly between the maintenance and operating divisions for the purpose of

Left: Effects of erosion in a venturi tube from the catalytic carrier line. Right: An eroded wedge plug-valve body from the catalytic cracking unit.



Left: Hydrogen blistering on the interior of a gas-cooler shell. Right: Experimental magnesium anodes installed on the water side of heat exchangers.

seeing that no delays are caused because of lack of information needed by the maintenance division and furnished by the operating division people. A top-flight operating man is generally used for this purpose and this man has proved his worth in recent shutdowns where good time has been made.

General

At the beginning of the actual turnaround work a safety meeting is held at which time safety precautions are discussed with the men by the maintenance superintendent and his foremen. A general idea of the work to be carried on during the turnaround is also discussed. These safety meetings are not time lost from the job but rather result in better understanding and certainly assist in accident prevention.

Manpower was mentioned previously; but it should be brought out that as the turnaround gets under way and progresses from day to day, a constant check is maintained by the maintenance superintendent and his supervisors in order to keep a well-balanced organization. If certain classes of work are falling behind, additional manpower is furnished by reassigning the balance of the work force. All bottlenecks, delays, and places where improvement can be made are noted by the maintenance superintendent so that on future turnarounds this information may be used to best advantage.

At the Heath refinery of Pure Oil there is a natural feeling prevailing among the workers that for every day the unit is down production of refinery products is forever lost. Therefore many of our men feel that it is every man's job to complete the turnaround work at the earliest possible date in order to make it more profitable for the company.

The maintenance superintendent is in complete charge of the turnaround work at the plant. This man and his staff of foremen "live" on the job during the entire working day of the turnaround period. It has been found that the plan of having the general plant superintendent available at the unit full time during the entire turnaround period is very advantageous from the standpoint of keeping the work going and completing everything according to schedules set up. Close supervision and leadership, important at all times, is of vital importance during these unit turnarounds.

Turnarounds at the large operating units at Heath (fluid catalytic cracker and the combination high-pressure units) have been completed very much according to schedules that have been arranged, and a minimum of downtime has resulted. Credit for this accomplishment can be passed along to others in our organization for various things that have taken place. Management people, the supervisory group, and the workers have all had a great part in this. Years of experience have been helpful in this work. Information that was made available from other concerns at the beginning of the fluid catalytic cracking operation has been of particular help in working out satisfactory turnaround efficiency at this unit.

The plan of sending men out to other plants to observe turnaround operations has been of great help in arriving at satisfactory work technique in turnarounds. Company officials have endeavored to work out improvement on what amounted to the practice and experience of other oil companies, and it is felt that results have been fairly successful.

Top: More than 40 craftsmen and their helpers make the repairs during unit turnarounds. Bottom: The cleanout gang. This group prepares the unit for inspection and repair operations.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Cost of Vacuum Plants

I thought you might be interested to know that the data of your Cost-imating articles, numbers 58 and 59, wherein you summarize over-all plant costs, check fairly closely with extensive other information available to us (a contractor), but Curve No. 8 of Cost-imating seems to be very low. As one example, G. E. Brooks shows a cost of $1,500,000 for a 9,500-bbl. per day plant, whereas your curve shows only about $300,000. B. L. W.

Information on the cost of vacuum plants seldom appears in the literature because vacuum units are not usually built as a separate job. Another difficulty in stating over-all costs is the great difference in the degree of processing that is encountered. The most simple flash tower or "jug" may consist of a vessel that has little more in it than a few baffle plates mainly for the purpose of catching mechanical entrainment. Thus, one 32,000-bbl. per day plant[10] was built in 1948 at a cost of only $571,000.

At the other extreme are fractionating-tower installations for producing lubricating oils or several side-draw products. Even in such plants there is a difference of opinion among contractors regarding the general design. Some use many plates between cuts and a relatively high vapor velocity whereas others use a lower velocity and only a few fractionating trays. Thus, big ranges in construction costs are encountered.

Scant Data Available

Although the G. E. Brooks[13] cost of $1,500,000 for a 9,500-bbl. per day plant was only an estimate shown for the purpose of illustrating a method, it is probably not very high for a vacuum distillation plant constructed during 1949-1950. The No. 5 and No. 8 lines shown for such plants in Cost-imating No. 59 *(The Oil and Gas Journal, December 1, 1949, page 93)* are probably too low. Scant data were available when they were prepared. Certainly a simple 9,500-bbl. per day flash-tower installation could be built much more cheaply than $1,500,000, and some distillation installations would be cheaper.

Table 1 and Fig. 1 indicate what are thought to be more accurate costs than those of Cost-imating No. 59. However, difficulty was encountered in attempting to distinguish between simple plants which are called vacuum flash and the variously more complicated plants called vacuum distillation plants. Likewise, cost information in the literature sometimes does not invite confidence. The cost of one 9,000-bbl. per day vacuum plant has been stated variously[11,12] as $1,000,000 and $1,500,000 (1950). It is probable that the completed cost ($1,500,000) will be different from the earlier estimates but in this instance the costs of other units for the same refinery were changed repeatedly. (One cost was reduced from 13 to only 2 million.)

Costs were converted from various years to 1946 by the Nelson Refinery Construction Cost Index which is published in the first monthly issue of The Oil and Gas Journal (see also Cost-imating No. 61, December 15, 1949, page 91).

TABLE 1—CONSTRUCTION COSTS OF VACUUM PLANTS

Cap., B.P.D.	Date	Construction cost—Stated	Construction cost—1946	Reference
Flash:				
3,500	1947	$43/daily bbl.	$128,000	1
4,000	1949	$500,000	359,000	5
3,000	1947	$43/daily bbl.	110,000	4
6,000	1947	$25/daily bbl.	128,000	4
(*)	1948	$35/hourly gal.	*230,000	7
32,000	1948	$571,000	430,000	10
15,000	1949	$700,000	500,000	9
4,000	1950	$333,200	234,000	12
3,580	1949	$28/daily bbl.	72,000	15
Dist.:				
750	1946	$167/daily bbl.	$125,000	3
3,000	1947	$100/daily bbl.	256,000	2
400	1929	$140/daily bbl.	78,000	6
1,000	1929	$ 75/daily bbl.	105,000	6
1,600	1929	$ 63/daily bbl.	141,000	6
2,400	1929	$ 59/daily bbl.	197,000	6
1,000	1929	$110,000	153,000	6
3,000	1929	$185,000	257,000	6
5,000	1929	$260,000	361,000	6
1,200	1948	$275,000	208,000	8
9,000	1950	$1,500,000	†700,000 and 1,060,000	11
9,500	1949	$1,515,000	1,080,000	13
7,000	1950-1951	‡$1,100,000	760,000	11

*Assumed average capacities of 3,000 and 7,000 B.P.D. †Two costs shown. ‡For a foreign plant. Also estimated from a combination atmospheric and vacuum unit.

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10. Refinery and Other Plant Construction, Pet. Refiner, August 1948.

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12. Foster, A., Petroleum Engineer, May 1950, p. A-43.

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14. Refinery and Other Plant Construction—Pet. Refiner, June 1950.

15. Author experience — about half of equipment available from atmospheric service.

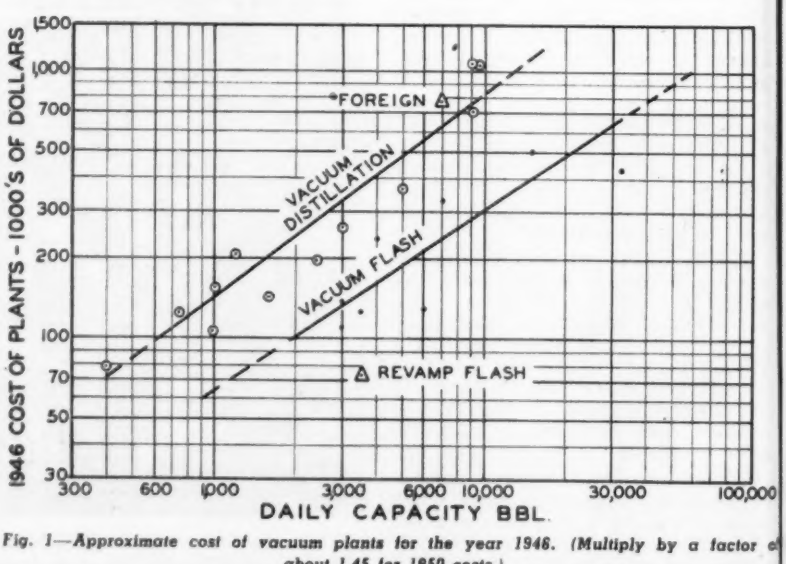

Fig. 1—Approximate cost of vacuum plants for the year 1946. (Multiply by a factor of about 1.45 for 1950 costs.)

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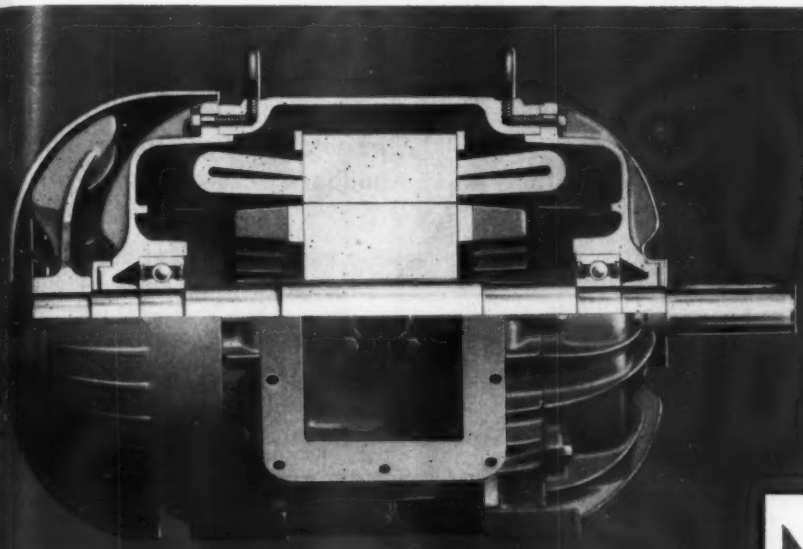

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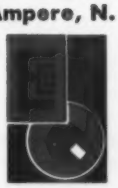

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XUM

Ditch being dug to provide normal cover of 2½ ft. in "bad lands" between Banning and Riverside, Calif. The 30-in. pipe for the project has been yard coated-and-wrapped prior to stringing.

New 83-Mile Loop Completed On Texas-California 30-In. Line

New loop will increase system's delivery capacity by 100,000,000 cu. ft. daily. Rough terrain in open spaces vied with fruit groves, urban areas, and truck farms in posing problems to the line's builders.

by D. H. Stormont
West Coast Editor

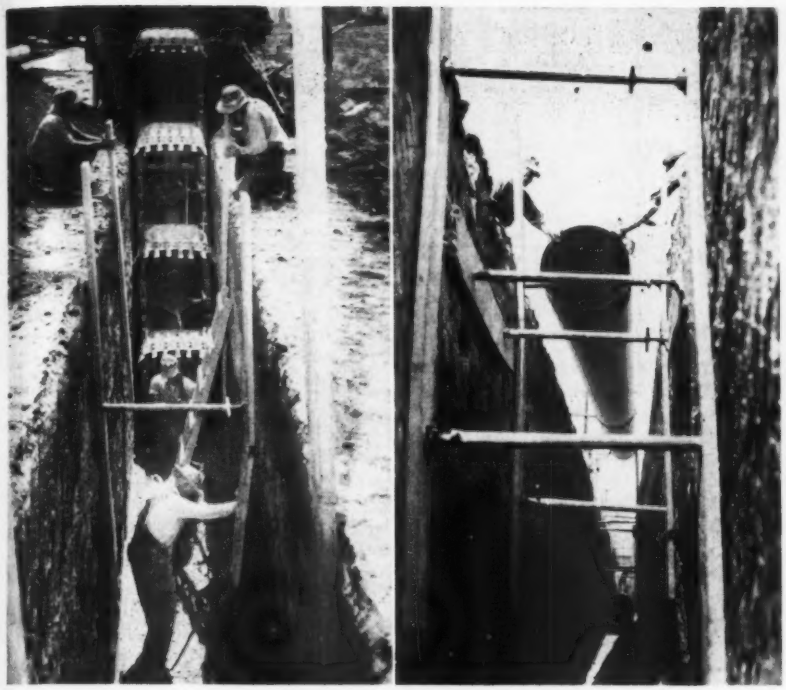
TO help meet rapidly expanding demand for natural gas in the Los Angeles metropolitan area, Southern California Gas Co., and its sister company, Southern Counties Gas Co., this month will complete an 83-mile loop on the 30-in. Texas-to-California pipe line. This new loop will increase the system's delivery capacity from 305,000 to 405,000 M.c.f. daily. By packing the new line in slack periods, the loop will also provide temporary storage of an additional 50,000 M.c.f. which can be called upon to meet peak loads.

The current project is a continuation of an extensive program of using Texas gas to supplement California gas in supplying the Los Angeles area. In 1947, when the companies completed their portion (214 miles) of the 30-in. Texas-California line from a point near Blythe westward, its terminus was at Santa Fe Springs. There it joined a 10-mile, 26-in. feeder, installed 2 years previously, into the main distribution system.

In 1948 and 1949, approximately 34 miles of 30-in. line was laid in the eastern and southern portions of the city's outskirts to provide additional distribution facilities. Also at that time, in anticipation of the current project, a 10-mile section of 30-in. was extended eastward to Puente from the eastern Los Angeles line. Next year, in order that greater flexibility of distribution may be attained, it is planned that the southern 30-in. leg will be extended around the western edge of the city into northwestern Los Angeles. This project will call for the laying of about 24 miles of 30-in. line.

The new loop, in reality a "Y" since

Smooth bending with hydraulic machine. No wrinkle or miter bends were used on the line.



Left: Because of the numerous sewer and irrigation lines in Riverside, Calif., trenching was done to a depth of 12 to 14 ft. along city streets. Efforts were made to restore a portion of the street to traffic service within 3 days after the ditch was opened. Right: The presence of equipment for shoring the sides of the deep ditch made it necessary to lower the 30-in. pipe in 62-ft. sections for welding operations carried on at the bottom.

it largely is separated from the original main line by distances varying from ½ to almost 5 miles, was laid westward from Whitewater to the Puente regulating station. The line purposely was deviated so as to lessen the possibility of both lines being knocked out of service at the same time by some natural occurrence, such as a landslide, or by sabotage. About midway in the loop, in the Moreno Valley, a 1,500-ft. crossover was installed between the two lines to further insure continuous service.

In constructing the loop considerable difficulty was caused by the rough terrain in the Bad Lands between Banning and Riverside and in the Puente hills area. As difficult as this work was, however, it was the work in urban areas, fruit groves, and truck farms which caused the greatest problems.

All pipe for the loop was manufactured in the Maywood plant of Consolidated Western Steel Corp. It was taken from there to Pacific Pipe Line Construction Co.'s yard at Montebello where a coal-tar-enamel coating and felt wrapping were applied. The coated pipe then was strung along the right-of-way. Construction of the line was a joint operation of Midwestern Constructors, Inc., Tulsa; Johnson Western Gunite Co., San Pedro; and L. E. Dixon Co. of Los Angeles.

Ditch normally was dug to a depth which would provide a minimum cover of about 2½ ft. At the numerous irrigation-ditch crossings and at many other points along the line, it was sometimes necessary to dig a 12 to 14-ft. ditch in order to clear the obstacle.

At the Whitewater River, normally a dry wash but subject to devastating flash floods, some 6,000 ft. of line was placed underground with a 10-ft. cover. Pipe used for this crossing was of ½-in. wall thickness and to protect it from pounding by boulders, in the event of a washout, a 1-in. coating of reinforced concrete was applied. At the only other major water crossing, the Santa Ana River west of the city of Riverside, a 750-ft. suspension bridge carrying 22-in. pipe was constructed.

Most up-to-date methods and equipment were employed in the line's construction, some of which are brought out in the accompanying photographs.

Louisiana Line Approved

WASHINGTON.—United Gas Pipe Line Co., Shreveport, has been given authority by the Federal Power Commission to construct additional facilities which will supply approximately 100,000,000 cu. ft. of gas daily to Louisiana.

The firm will spend $1,813,000 for improvements in Webster, Bossier, and Ouchita parishes, and will construct 16 miles of pipe line, a compressor station, and gas-dehydration plant.

Lowering in a long bent section at the eastern edge of the "bad lands." Traveling internal-lineup clamps were used by the pipe gang ahead. The quality of welding was checked by the gamma-ray inspection procedure.

XUM

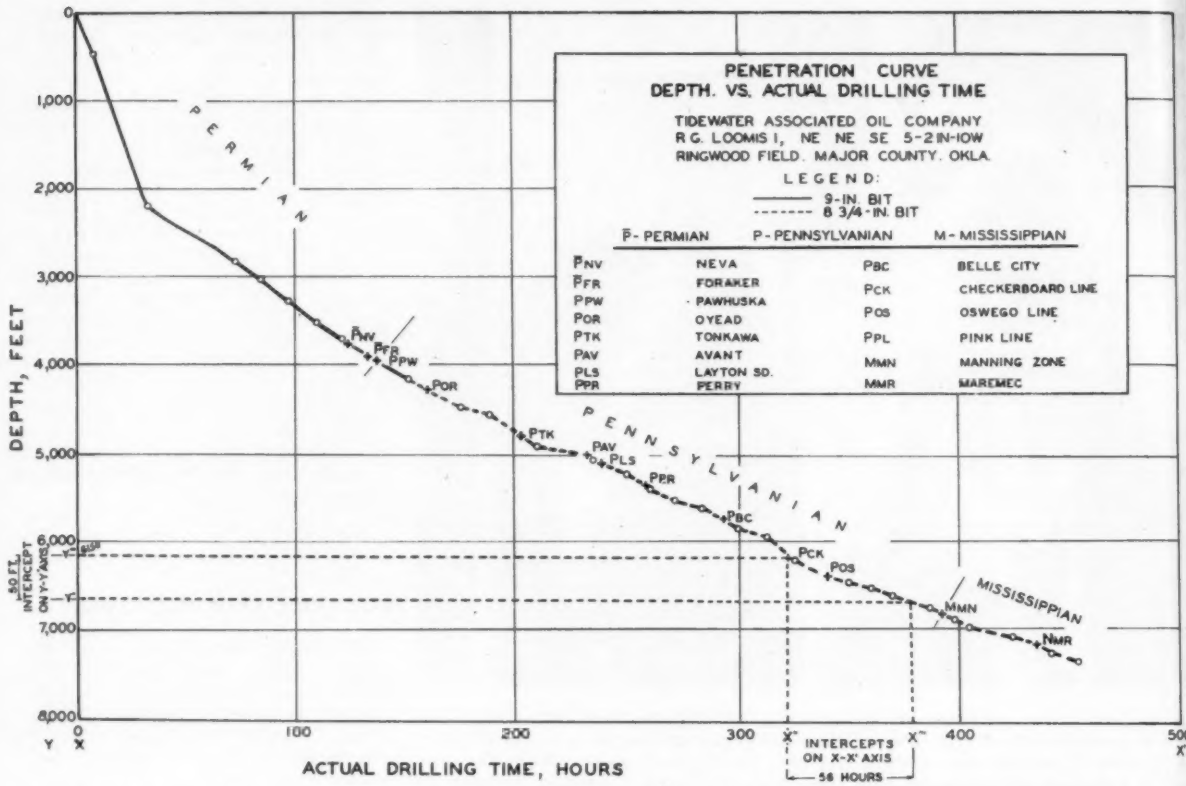


Chart showing improved type of penetration curve of a well drilled in Ringwood field, Major County, Oklahoma. The rate of penetration in feet per hour may be calculated by dividing the number of feet intercepted on the vertical axis by the number of hours intercepted on the horizontal axis. In this case, Y" — Y"' is 500 ft., X" — X"' is 56 hours, and 500/56 is 8.94 ft. per hour, the average rate of penetration from 6,100 to 6,650 ft.

New Penetration Curve

by Joseph A. Kornfeld
Houston District Editor

CONTINUAL emphasis placed on improved penetration rates places responsibility on the drilling engineer to evaluate past results and to recommend improved drilling methods and techniques. From the time the discovery well is completed until the field is completely developed, the engineer will refer to conventional penetration curves and will correlate them to obtain facts from which to prepare specific recommendations seeking reduction in time on bottom.

Graphic technique.—The actual drilling time, obtained from the bit record, is plotted versus depth on cross-section 10-by-10 graph paper (10 divisions to the inch). Three types of segmentation mentioned above are drawn as follows:

1. **Bit footage.**—The depth at which a new bit is run is shown by a hollow circle. A line is drawn connecting each of these points.

2. **Effect of bit size on penetration.** Portions of the bore hole penetrated by bits of the same size are shown in solid, other portions in dashed lines.

3. **Geologic.**—On the curves drawn here, crosses are marked at intervals to indicate the top and base of each formation. These data may be obtained from the scout or geologist. Opposite each cross an abbreviation is carried, corresponding to the name of the formation, i.e., PFR referring to P for Permian and FR for Fort Riley. The entire geologic interval for a system may be grouped together and set out by special lettering on one side of the curve such as Pennsylvanian.

Other factual data may be lettered in such as the type of rock bit used, the number of drill collars used, and the weight carried on the bit.

Performance calculations.—Performance at any time in the history of the well may be read off of the curve. This can be done by dividing the intercept on the X-X', or horizontal scale, by the intercept on the Y-Y', or vertical scale, to obtain the rate of penetration in feet per hour. For example, in the well shown here in Ringwood field, Oklahoma, the interval from the top of the Checkerboard lime to the top of the "Pink" lime, comprising 500 ft., was drilled in 56 hours, or at an average penetration rate of 8.9 ft. per hour. It will be observed by inspection that this required nearly five bits to penetrate this section and that the slope angle (with reference to the vertical) is greater than the average for the entire Pennsylvanian interval of 10.3 ft. per hour.

Applications.—Utility of the use of segmentation lies in the following:

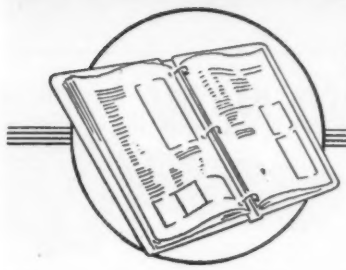
1. Placing emphasis on the choice of rock bits to increase penetration rates for a formation of a particular type of lithology, i.e., a short chert section, such as the Devonian of West Texas, or a long shale section, like the Pennsylvanian and Mississippian Caney of central Oklahoma.

2. Evaluation of the relative performance of two company rigs or contractors' rigs on offset wells.

3. Evaluation of cable-tool vs. rotary drilling for two offsets in the same field.

4. Correlation of relative penetration efficiency of diamond coring vs. rock-bit drilling as in the Weber sandstone reservoir, Rangely field, Colorado.

The latter three applications may be made by superimposing one curve on the other.



THE REFINER'S notebook

Process Lag in Controlled Systems

LAG in controlled systems was discussed on this page March 2, 1950, and has been referred to from time to time in subsequent installments. A more specific discussion of process lag is undertaken in this installment.

Control circuit.—The problem of lag in a controlled system may be approached by considering the process as a closed control loop or circuit, as suggested by Ziegler and Nichols.[1] Thus for the reboiler of Fig. 1 (top) the process input (supply side) is the steam to reboiler, which is also termed the control agent. Steam flowing through the reboiler heater tubes vaporizes a portion of the liquid bottoms. Vapor returning to the column is the controlled medium and constitutes the process output (demand side). Process output ties in with the controller input, assuming location of a primary measuring element in the reboiler vapor line which senses change in vapor temperature. Changes in the input to the controller are converted into changes in controller-output pressure which act on the control valve diaghragm to open or close the valve in the steam supply line, providing a tie-in with the process input and completing the control circuit.

Types of lag.—The various process lags in the controlled system of Fig. 1 are supply-side capacity, transfer, demand-side capacity, and distance-velocity lags. In addition the system also has some response or measurement-control lags, including those in the primary measuring device, controller, and pneumatic transmission lines. The sum of all the separate lags shows up as an over-all or "effective" lag for the complete control circuit and may be thought of as the time interval which exists between a change in temperature of reboiler vapor and the corrective action initiated by the controller and carried out by the control valve to bring the temperature back to the desired value or control point.

Starting on the process input side there is a **supply-side capacity lag** associated with the amount of steam passing through the heater tubes in a given time. For good control this capacity must be large enough, must store or carry enough heat in a given time to supply the demand in that same time.

Next in order as we go around the control circuit is a **transfer lag** which in this particular case is a heat transfer lag. The transfer lag is the time it takes to move the heat energy from the supply side through the resistances offered by the steam film, the wall of the tube, and the hydrocarbon film on the outside of the tube. It also depends on the temperature difference between steam and hydrocarbon and in certain cases on the amount of scaling or coking of the heater tubes.

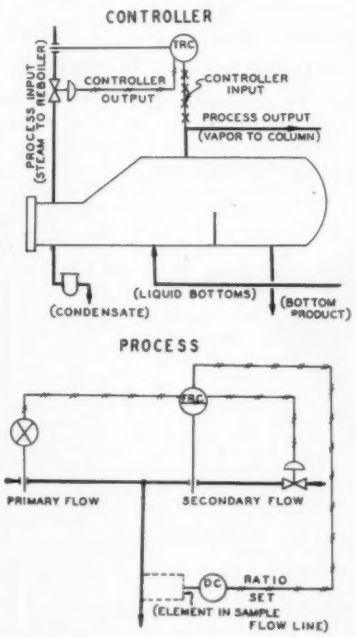


Fig. 1—(Top) Refinery reboiler used as an example to illustrate lags in a controlled process. The process output ties in with controller input and the controller output ties in with process input to form a closed control circuit. (Bottom) Illustration of ratio flow control blending two streams to obtain a mix of given density. Effect of distance velocity lag existing here would show up as a recording lag if density controller were replaced by a recorder without connection to the flow ratio controller.

The **demand-side capacity lag** is the storage lag associated with the volume of liquid bottoms in the reboiler. If this volume is large it will take longer to obtain an increase in vapor temperature, when more steam is admitted to the heater, than for a small volume. It is ordinarily desirable to have a fairly large demand-side capacity since this will have a stabilizing effect tending to dampen out unstable control that would be caused by a sudden or large load change. However, the demand-side capacity could be too large. An excessively large volume of liquid in the reboiler would take too long to heat up and result in abnormal capacity lag on the demand side with poor response to controller and control-valve action.

A transportation or distance-velocity lag also exists in the reboiler system of Fig. 1. It exists between the reboiler, or some point within the reboiler, and the point at which the temperature-measuring element is located (or between the process output and controller input). It also exists between controller output and process input, depending upon the distance the steam must travel from the control valve to the reboiler-heater inlet. Distance-velocity lag may also be illustrated by reference to Fig. 1 (bottom) which represents the blending of two streams to a given gravity. If a density recorder were used instead of the density controller as shown, the record would exhibit a lag depending upon the location of the recorder and the rate of flow of the blended steam. Distance - velocity will be taken up more fully, together with further discussion of process lags and their effect on response characteristics of the process, in the next installment.

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1. Ziegler, J. G., and Nichols, N. B., "Industrial Process Control," Chem. Eng. Progress, June 1947, p. 309.

2. Rhodes, T. J., "Industrial Instruments for Measuring and Control," McGraw-Hill Book Co., New York, pp. 374 ff.

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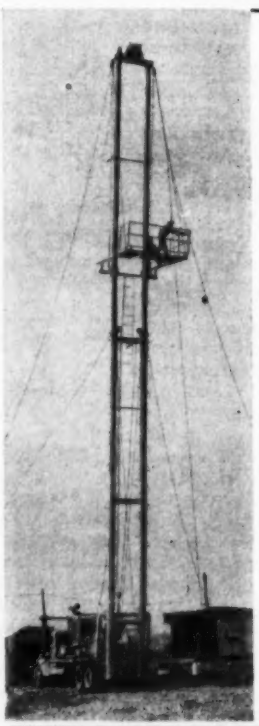

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Further Evidences of Gravity Control

CONSIDER as an extreme case an open tank lying on its side to simulate an oil reservoir with structure as shown in Fig. 1. In this tank, at any time, the static pressure distribution would be equal to the density gradient of the fluids. In the region of the reservoir filled with liquid the gradient would be different from that in the region filled with gas. Assuming the reservoir to be elongated, the pressure contour lines would appear as in Fig. 2.

No actual reservoir is as ideal in its pressure distribution as the tank cited, but where gravity-drainage tendencies are pronounced the tendency for pressure contour lines to follow the structural contour lines should also be pronounced. This tendency may be masked early in the life of the field by the higher gradients set up by a solution gas drive and the inability of the reservoir to come to rapid static equilibrium. Also, in attempting to evaluate pressure readings for this purpose it is necessary to have pressures which represent those levels in the individual wells from which production occurs, not pressures which are corrected to some datum plane.

Gas-oil ratios can likewise be used. In an area where drainage is important the wells high on structure will have a tendency to go to high gas-oil ratios earlier than those low on structure. In a perfectly homogeneous reservoir these gas-oil ratios should also follow structural contours as illustrated by the tank analogy. This tendency is commonly recognized by the formation of "secondary gas caps" in those oil reservoirs where structural gas and oil segregation is significant. The formation of a secondary gas cap in a reservoir where no original gas cap existed can be explained only by a counterflow of gas updip, which is a good evidence of gravity effects.

Lewis[1] refers to the gas-oil-ratio increase high on structure as an indication of gravity control. The increase should be most pronounced and in the nature of a sharp break when the production decline curve shows a sharp break.

As the reservoir proceeds in its production history both the pressure contours and gas-oil-ratio contours change, but where gravity is an important consideration the change is principally in the relative position of the contour lines not in their general shape. This would be a "spreading gas cap."

The fact that high gas-oil ratios are high on structure is not in itself a criterion for gravity drainage. This could also be the case when a gas drive results downdip from the gas in a gas cap. Under the latter condition, however, the pressure gradients would be opposite in direction to gravity gradients because a gradient would exist in order to flow the gas down structure into the oil zone. The pressure and gas-oil-ratio contours must be examined together and in conjunction with production data.

In this respect it is sometimes stated than an expanding gas cap is synonomous with gravity drainage. This is so only if the drainage of oil is fast enough to prevent the expanding gas from producing the oil below it by a gas drive. In either case, the gas cap would appear to expand, but in the case of the true gravity drainage the wells lower on structure would show relatively no increase in gas-oil ratio until the level of drainage had passed, while in the case of the gas cap drive the wells low on structure would show a regular increase in gas-oil ratio with no sharp break indicating the passage of an oil level. The ultimate recovery in the first case would be that of a true gravity drainage and in the latter case it would be that of the gas drive and would depend upon the amount of gas available.

It has been suggested[2] for this reason that field calculated k_g/k_o curves can be used to indicate the presence of gravity control. Fig. 3 shows two such curves compared, the higher one being calculated for a gas-drive condition, the lower for the presence of some gravity control. For the gas-drive condition the curve should be no different from that for solution gas drive, assuming no bypassing. For the presence of gravity segregation the curve should be lower at all points, if the segregated gas is not dissipated.

References

1. Lewis, Gravity Drainage In Oil Fields, A.I.M.E. Trans. 1944, Vol. 155.
2. Gooch and Watson, Interpretation of Field Data on the Basis of Relative Permeability Ratios, World Oil, Jan. 1950.

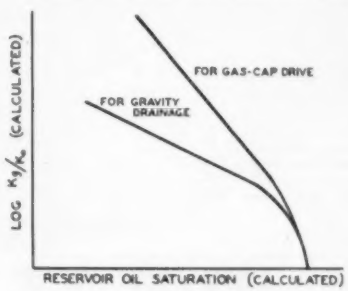


Fig. 3.

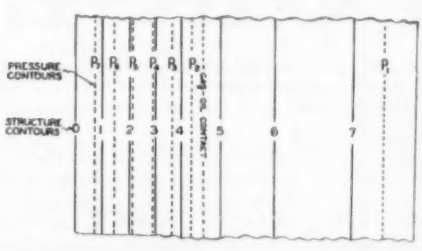
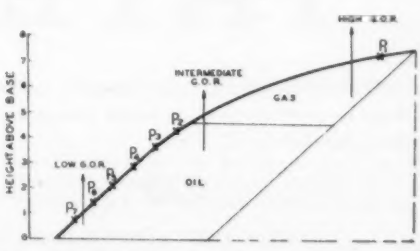


Fig. 1 (Left).

Fig. 2—(Right) Showing parallelism of structure and pressure contours for tank of Fig. 1. $P_3 > P_1$, $P_2 > P_3$, etc.



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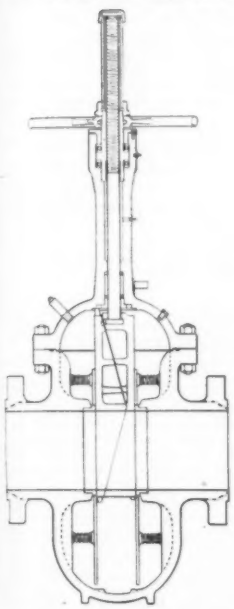

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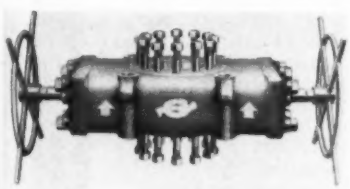

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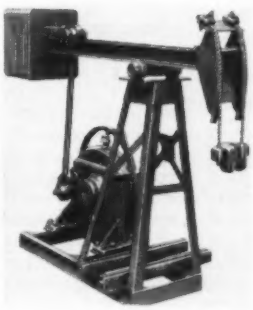

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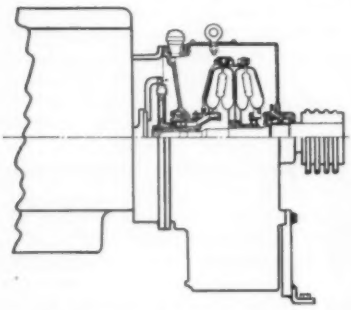

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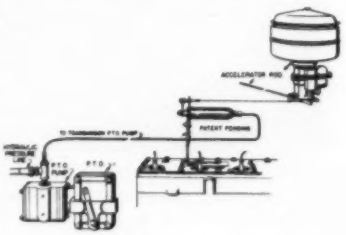

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30 NATIONAL DEEP-WELL CASING is a tougher, stronger, higher-yield casing. It is made from quenched and drawn steel having a far higher minimum yield strength than the present top standard grade of casing, and special facilities for its production have been installed, comprising the most modern heating and quenching equipment available. The new deep-well casing will permit greater safety and efficiency in the difficult and often hazardous task of deep-well drilling. *National Tube Co.*

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It's BAASH-RO[illegible] .. FOR EVERYTHING IN SQUARE KELLYS.

All Sizes—All Designs—All Lengths

PLUS the Most Advanced Construction and Metallurgical Features!

FOR YEARS Baash-Ross has led in the development of a superior line of square Kellys to meet the increasingly rigid requirements of modern drilling operations. And best of all, these top-quality Kellys are available in a range of sizes and designs to meet every operator's need...with or without stop shoulders, elevator spaces, etc.... and in all lengths.

In fact, Baash-Ross provides everything in square* Kellys!

They have Everything in Performance Features!

● Baash-Ross Square Kellys are forged end-to-end from one solid piece of restricted analysis, fine-grained alloy steel, with each heat of steel individually checked for quality by separate test specimens.

After forging and before heat treating, the dimensional accuracy of the forged square section is checked by an API Kelly Sleeve Gage which must pass freely over the entire length of the square to check maximum allowable tolerances across flats and across corners. Also, accurate caliper measurements are taken to make sure no portion of the driving section is undersize!

● Next, a series of heat-treating operations performed over the *entire length* of the Kelly in one operation, develop the metallurgical properties of the steel to provide the *best balance* of shock-resisting toughness and wear-resisting hardness.

● Additional heat-treatments harden the threaded ends for maximum life and service.

● All residual forging stresses are relieved by these heat-treating processes, thus eliminating the most prevalent cause of bending and deformation.

● The Kellys are then carefully bored by precision drilling machines so that the bore is precisely centered end-to-end, then double-checked by highly-accurate survey devices. For products with bores 2¼" diameter or larger, wall thickness of the Kelly *must not* vary more than one-*sixteenth* inch for each 10 ft. of product length, or fraction thereof.

● The Kelly itself is also accurately surveyed for straightness and *must* be straight within one-*eighth* inch when measured at *any* point over its entire length.

● The alignment of the projected axis of each threaded end, when checked with the precise Baash-Ross Alignoscope, *must* be within one-*eighth* inch of the longitudinal axis of the Kelly for each 10 ft. of Kelly length, or fraction thereof.

● In addition, threads *must* pass, not only all API specifications, but also unusually rigid Baash-Ross specifications on thread form, taper, lead, finish, etc.

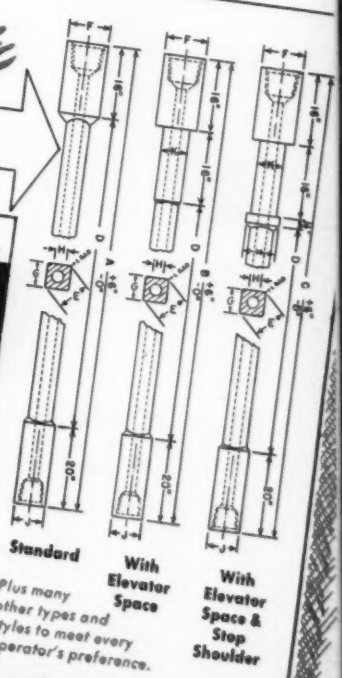
The above highlight only a few of the many controls maintained by Baash-Ross to insure absolute straightness, long-life and maximum all-around performance from every Baash-Ross Kelly!

They are Available in .. All Sizes .. All Designs

Baash-Ross "Trubore" Forged Upset Square Kellys

Square Size	Length Overall	Length Working	Top Upset Joint Size A.P.I. Left-Hand	Top Upset O.D.	Bottom Upset Joint Size A.P.I. Right-Hand	Bottom Upset O.D.	Bore I.D.	Across Corners	Across Flats	Elevator Space O.D.	Corner Radius	Stop Shoulder O.D.	Cu. Ft. per Ft.†
2½	35	36-4	32	4½ Reg.	5½*	2⅝ Reg.	3¼	1 11/16	3 15/16	2⅝	2 11/16	4 5/16	3⅝	*.165
	38	39-4	35	6⅝ Reg.	7⅝	2⅝ I.F.	3⅝	1⅝						.327
	40	41-4	37				4⅛	1⅝						
3⅛	35	36-4	32	4½ Reg.	5½*	2⅝ Reg.	3⅝	1⅝	3 15/16	3	2 11/16	5⅛	4⅝	*.165
	38	39-4	35	6⅝ Reg.	7⅝	2⅝ I.F.	4⅛	1⅝						.327
	40	41-4	37				4⅝	1⅝						
4½	35	36-4	32	4½ Reg.	5½*	3½ Reg.	4⅝	2 1/16	4 11/32	3½	3 13/32	½	4⅝	*.165
	38	39-4	35	6⅝ Reg.	7⅝	3½ F.H.	4⅝	2 1/16						.327
	40	41-4	37			3½ I.F.	4⅝	2 1/16						
	54	55-6	51				4⅝	2 1/16						
5⅛	35	36-4	32	4½ Reg.	5½*	4½ Reg.	5½*	2⅝	5 5/16	4¼	4 19/32	½	5⅝	*.165
	38	39-4	35	6⅝ Reg.	7⅝	4½ F.H.	5⅝	2⅝						.327
	40	41-4	37			4½ I.F.	5⅝	2⅝						
	54	55-6	51				5⅝	2⅝						
6	38	39-4	35	6⅝ Reg.	7⅝	5½ Reg.	6⅝	2⅝	6 9/32	5¼	5 5/8	½	6¾	.327
	40	41-4	37			5½ I.F.	6⅝	2⅝						
	54	55-6	51				6⅝	2⅝						
	38	39-4	35	6⅝ Reg.	7⅝	6⅝ Reg.	7⅝	3½	7 7/32	6	6⅝	½	8	.327
	40	41-4	37			6⅝ F.H.	7⅝	3½						
	54	55-6	51				7⅝	3½						

Sizes shown in RED are A.P.I. standard.
* Alternate 6⅝ inches O.D. — 100 cu. ft. per lineal ft
† Volume based on largest diameter of kelly



Plus many other types and styles to meet every operator's preference.

The Baash-Ross lines of Hexagon and Octagon Kellys are equally complete. Write for data.

BAASH-ROSS KELLYS ARE AVAILABLE THROUGH LEADING SUPPLY STORES!

XUM

small-aggregate concrete, paint, plastic coatings, bituminous coatings, refractory insulating materials, and sand. Materials are forced against walls or forms at high pressure, resulting in superior strength, flexibility, and waterproofing characteristics. Manufactured as complete trailer-mounted unit with engine and air compressor attached, or as a small unit to be used with a separate air compressor. *Stuk-O-Rite Co., Inc.*

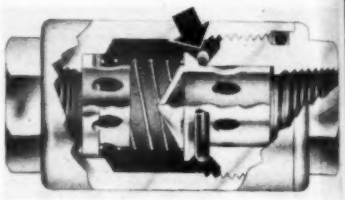
IT'S NEW CHECK IT

35 P-B XTRUDE is made from a high-grade thermoplastic which assures a uniformity of product. Designed primarily for salt-water-disposal lines, crude-gathering lines, gas-distribution systems, and similar uses where a working pressure of 100 psi. is not exceeded. Sizes range from ½ to 4 in. with bursting strength safety factors of 4 to 1 on the 2-in. and 3 to 1 on the 3 and 4-in. sizes. The material is a stable compound, almost completely inert, unaffected by chemicals which ordinarily attack pipe, such as sour crude, corrosive salt water, and soil acids and alkalies. Lengths are joined by a cemented sleeve coupling, applied quickly and easily after which the joined tube can be handled and moved within a few minutes by field personnel. No special tools required for fitting. *Perrault Brothers, Inc.*

IT'S NEW CHECK IT

36 POLYETHYLENE FLAME SPRAYING is a method of applying coatings on steel tanks, tank cars, and processing equipment. Flame-spray process uses no solvents and applies coating in thicknesses from 1/32 to ¼ in. After the tank to be coated has been sandblasted, polyethylene in powder form is blown through specially designed flame spray equipment. Deposited on the tank in melted form, the polyethylene sets up to a tough, nonporous film which has unusual resistance to practically all chemicals and corrosive materials. This method of applying protective coatings eliminates danger of pin holes and other defects which might permit corrosion to start. The resulting odorless, taste-free, completely nontoxic coating is recommended for use in chemical, petroleum, and metal-working industries wherever severe corrosion problems exist. *Houghton Laboratories.*

37 CIRCLE SEAL CHECK VALVES are in a full range of sizes from ⅛ to 1-in. NPT. Valves are bubble tight in leakage tests, providing absolute sealing at any differential pressure. An added feature of the design is quick opening and positive closing at extremely low pressures. Opening pressures are as low as 1 psi. differential in the standard-pressure types and 4-in. water column in the low-pressure types. Poppets close at zero flow before return flow starts. *James-Pond-Clark.*

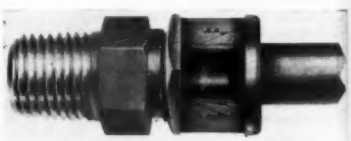


IT'S NEW CHECK IT

38 TRUCK HOIST is electrically powered, mast-and boom, cable-lift type. It is rated for a straight vertical lift of 1,000 lb., or for a lift or pull of 2,000 lb. with split block and half tackle. It is powered by a patented reversible motor, fully enclosed in a housing beneath the truck bed. This motor operates on the regular battery, but draws a negligible amount of juice during normal usage. Remote push-button control is safety feature. The 6-ft. mast is topped by a 4-ft. horizontal boom which swings through 360° for easy pickups or drops over either the back or the side of the bed. Forty feet of wire cable in a cable carrier is mounted in permanently lubricated Oilite bearings and the cable travels 6 in. per second. *Hoist-O-Matic Co.*

IT'S NEW CHECK IT

39 SWAGELOK FITTING provides a vacuum-tight seal. Two ferrules and threaded chuck inside the Swagelok's nut, clinch tight around the tubing wall, providing a leak-proof seal. Laboratory tests have demonstrated that the tubing will burst before the fitting will leak. These fittings will hold heavy or thin wall tubing equally well. They are made for use with tubing material or aluminum, brass, copper, steel, stainless steel, and plastic. No flaring of the tubing is necessary. During assembly the tubing remains stationary throughout the brief tightening operation. No damaging torque or twisting is transmitted to the tube during the one and one-quarter turns. *Crawford Fitting Co.*



IT'S NEW CHECK IT

40 PESCO TAPESTER 5. This machine was developed to meet the need for a light-weight wrapping machine with the advent of polyethylene-backed adhesive tapes into the pipe-coating field. Larger machines are being designed and manufactured. Special wrapping heads to accommodate various wrapping materials, pipeline felt, for example, can be supplied. Other sizes will wrap up to 12-in.-diameter pipe. *Plastic Engineering & Sales Corp.*

NATURAL GAS

Leidy Field Outlet Planned

WASHINGTON.—Increased supply of natural gas from the Leidy field in Clinton and Potter counties, Pennsylvania, is sought by New York State Natural Gas Corp., New York City.

Federal Power Commission has been asked for authority to build 44½ miles of 16-in. and 18-in. pipe line which would connect New York State Natural's natural-gas-transmission system in Pennsylvania with the Leidy field. Cost of the installation is estimated at $1,582,700.

The new link would enable the company to take 60,000,000 cu. ft. of natural gas daily from the field. The present field service is made through a 6-in. oil line which New York has leased temporarily.

Delivery Increase O.K.'d

WASHINGTON.—The Federal Power Commission has granted authority to Michigan Gas Storage Co., Jackson, Mich., to install two 2,200-hp. compressor units at a cost of $765,000 to handle increased deliveries to its customers.

Consumers Power Co., Jackson, a Michigan Gas customer, demanded a large increase of gas daily to meet winter demands brought about by unprecedented increase in space-heating requirements.

Sales Revenues Up

WASHINGTON.—Natural gas continued to dominate the market with its increased usage during the second quarter of 1950, ending June 30, American Gas Association reported recently. Total revenues from natural-gas sales were $319,000,000, a rise of 28.1 per cent over the same quarter of 1949. In contrast, revenues from manufactured gas in the same period totaled about $117,000,000, representing a decrease of 1.5 per cent from the second quarter of 1949.

For the 12 months ended June 30, revenues from natural-gas sales were $1,240,000,000, an increase of 18 per cent over the previous year. Revenues from manufactured gas were $478,000,000, a gain of 0.7 per cent.

Sales of natural gas during the second quarter totaled 882,000,000 M.c.f., showing an increase of 22.1 per cent over the like quarter of 1949. For the full year, sales amounted to 3,441,000,000 M.c.f., a gain of 13.9 per cent over the previous year.

Natural-gas sales for July continued their upward trend over year earlier figures, establishing a gain of 23.9 per cent. Total sales for the month were 2,499,773,000 therms. This compares with 2,016,811,000 therms sold in July 1949.

For 12 months ended in July, 1950, natural-gas sales were 35,921,549,000 therms, up 14.4 per cent over 31,393,685,000 therms sold a year earlier.

Gas Utilities Absorbed

TULSA.—Four utility systems distributing natural gas in the Guthrie, Okla., area have been absorbed by Oklahoma Natural Gas Co., according to an agreement approved by the board of directors. The four companies last year served 6,000 customers, and had a gross income of $450,000, with net of $100,000.

O.N.G. is scheduled to take over operation of the four units on November 1, following a stockholders meeting called for October 10 in Wilmington, Del.

Outstanding stock will be acquired in Guthrie Gas Utilities Co., General Fuel Corp., serving Dover and Hennessey; Kingfisher Gas Co.; and Oklahoma Central Gas Co., serving Crescent.

Seeks to Connect Service

WASHINGTON. — To convert its service in northeastern New York from manufactured to natural gas, Niagara Mohawk Power Corp., Syracuse, has applied to the Federal Power Commission for authority to construct a 55-mile transmission line into Watertown and other communities.

Losses over a 5-year period are cited by Niagara as necessitating the proposed $1,991,000 development. For the 12-month period ended June 30, 1950, a service deficit of $140,071 was reported. By changing to natural gas, Niagara estimates a first-year profit of $22,890, mounting to $214,000 in 1955.

The 10¾-in. line of the proposed system would convert the present manufactured-gas territory in Watertown to straight natural-gas service, and would supply communities along the route which are now without service. These include Mexico, Pulaski, Mannsville, Adams, Adams Center, Sandy Creek, and Lacona. Supply would be furnished by New York State Natural Gas Corp.

Service Extension Asked

WASHINGTON. — Three subsidiaries of Penn Fuel Gas, Inc., have filed applications with the Federal Power Commission, proposing natural-gas service in the Boroughs of Bangor, Roseto, Pen Argyl, Stroudsburg, and East Stroudsburg, Pennsylvania.

The three companies now distribute liquid-petroleum gas. They ask authority to construct connecting feeder lines with the transmission system of Manufacturers Light & Heat Co., Pittsburgh.

FPC Orders Evidence

WASHINGTON. — Plans of Texas Eastern Transmission Co., Shreveport, for expanding daily sales capacits of its pipe-line system by 476,000,000 cu. ft. of natural gas, have been delayed until further evidence is given to the Federal Power Commission. Formal order for the additional facts has been issued.

Texas Eastern must submit an estimated system-wide cost of service with the operating expenses itemized. When an earlier request was made, Texas Eastern indicated it would not voluntarily comply.

Trinidad Asks Gas Supply

WASHINGTON. — Trinidad, Colo., is preparing to spend $1,100,000 in providing natural-gas service for its residents. Authority to obtain the facility has been asked of the Federal Power Commission, requesting an order that Colorado Interstate Gas Co., Colorado Springs, sell the city 1,000,000 cu. ft. of natural gas daily.

The city proposes to construct a 35-mile pipe line connecting the local distribution system with Colorado's pipe line. Provision is sought in the commission's order for connections to be installed, linking the two systems.

New Facilities Approved

WASHINGTON. — Meter stations will be constructed by Texas Gas Transmission Corp., Owensboro, Ky., to service 2,000,000 cu. ft. of natural gas daily in Arkansas and Kentucky communities.

The facilities will permit delivery to the City of Carrollton, Ky.; Louisville Gas & Electric Co., LaGrange, Ky.; and Arkansas Power & Light Co., Parkdale, Ark. Authority for the improvement was given by the Federal Power Commission.

Gas Facilities O.K.'d

WASHINGTON.—New facilities to distribute natural gas in Bluefield, W. Va., and Bluefield, Va., have been authorized by the Federal Power Commission.

Amere Gas Utilities Co., Charleston, will build a measuring and regulating station to make delivery available to Bluefield Gas Co., and Bluefield will construct 14.3 miles of 6-in. pipe line to transport the natural gas to its distributing system. Total cost of the Bluefield project is $267,200.

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HOUSTON 11, TEXAS

PIPE LINES

Club's Plans Under Way

HOUSTON.—An organizational meeting has been held here for the Pipe Liners' Club of Houston which will be patterned generally after the club of the same name in Tulsa.

J. E. Green, Shell Pipe Line Co., presided at the initial meeting of the group. Organization and aims of the club were explained by C. R. Tisdale, Tidal Pipe Line Co.; Brant Rawson, Maintenance Engineering Corp.; Donald Bond, Texas Pipe Line Co.; Frank O. Stivers, Humble Pipe Line Co.; and Joe Cahill.

Fifty-seven pipe-line people signed up for the new club at the organizational meeting. Candidates for officers will be chosen from the group and an election held at the October meeting. The club plans to meet on the third Monday night of each month. Meetings will be of a technical nature, but will be held to a practical level. The bylaws provide for supplier's memberships, but these are limited to 25 per cent of the total membership.

West Coast Names Stanley

F. E. Stanley, president, Midwestern Constructors, Inc., Tulsa, has been elected a director of West Coast Pipe Line Co. and chairman of the committee on engineering and construction for the proposed crude-oil pipe line to be built from West Texas to California.

Pan-Am Station Started

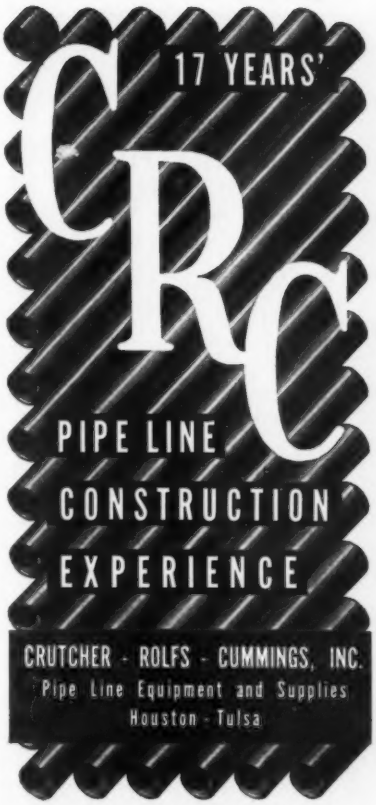
HOUSTON.—Pan American Pipe Line Co. has begun construction of a temporary 900-hp. booster station and auxiliary facilities near Sterling City, Tex., to increase the capacity of its 10¾-in. West Texas crude line from 37,500 to 49,500 bbl. daily.

Dedication ceremonies for Pan American's new $2,500,000 crude artery were held only a few weeks ago. *(The Oil and Gas Journal, September 14, 1950, page 140.)* It moves oil out of Scurry, Borden, and Howard counties in West Texas for a distance of 80 miles to a point 25 miles west of San Angelo. It connects there with two parallel 8-in. lines before joining with Humble Oil & Refining Co.'s main 18-in. trunk line from Kemper to Satsuma.

The new booster facilities will help take care of the record production in the Canyon Reef fields of West Texas. It is planned to complete the station by the end of this month.

Ira O. Walker, president of the company, said the facilities being constructed are of a relief nature because of the difficulty of securing materials. However, the company has formulated definite plans to replace these temporary facilities with permanent equipment.

BIG CUT.—Fred Balderidge Co., Opelousas, La., which has contract for lowering of two river crossings for Shell Oil Co., moved 49,000 cu. yd. of earth to make this cut in the bank of the Brazos River near Katy, Tex. The 10-in. line will be laid 4 ft. deep on the river bottom to escape scouring action. Trojan Construction Co. has contract for reconditioning of 40 miles of the line, which runs from West Texas to Houston.



20" Line across the Mississippi River . . . by LATEX in 1949.
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IN its 32 years of operation, Oklahoma Contracting Corp. has laid more than 12,000 miles of pipe line for major oil and natural-gas companies in the United States and South America.

History.—The present firm is a descendant of Jones & Braden, which was organized in Tulsa in 1918. Subsequently the organization had a series of names with "Oklahoma" in the title. T. R. Jones, on of the founders, was active as president of the organization throughout its history until recently when T. A. Hester became president. Early in 1950 Oklahoma Contracting Co. was merged with J. R. Horrigan Construction Co. to form Oklahoma Contracting Corp.

T. R. JONES

T. A. HESTER

In 1930 the firm performed an outstanding construction feat when it laid 800 miles of parallel 10-in. lines for the entire Ajax Pipe Line Corp. Tulsa-to-Wood River, Ill., system, and simultaneously laid 350 miles of 24-in. for the "Mo-Kan" project which is now the Panhandle Pipe Line Co. system.

BEN O. LAW

W. H. LAW

During the war more than 600 miles were laid for War Emergency Pipelines, Inc., consisting of approximately 25 per cent of the entire Big Inch and Little Big Inch projects. In the WEP undertaking, Oklahoma demonstrated the advantages of "stove piping" big-inch construction.

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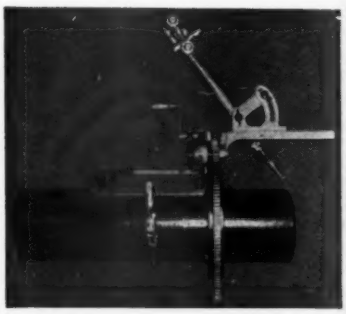
Maximum SPEED
Minimum COST



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Present operations.—Of the company's 1950 construction program, less than 80 miles now remain to be laid to complete 400 miles of big-inch pipe in several sections contracted for Transcontinental Gas Pipe Line Corp., Portland Pipe Line Co., and Tennessee Gas Transmission Co. Earlier this year

M. W. STAPLES

PAUL HALBERT

Oklahoma Contracting finished 160 miles of 8-in. for Salt Lake Pipe Line Co.

In connection with its 1951 pipeline-construction program, Oklahoma has already made plans for the bulk of work for its six main-line spreads.

Personnel.—T. A. Hester, president, and Paul R. Halbert, vice president, became partners with Jones in 1941.

J. R. Horrigan was lost this summer with a party of five people in a company airplane, which disappeared during a flight from New Jersey to Portland, Me. No trace of the plane has been found, although the U. S. Coast Guard and other groups have searched diligently.

Ben O. Law and W. H. Law, vice presidents, joined the company through the Horrigan merger. They started in pipe-line work in 1928 in an Oklahoma gang. M. W. Staples is secretary-treasurer.

Triangle Extension Planned

A 100-mile, 10-in. line is now being planned as an extension of Triangle Pipe Line Co.'s products-pipe-line system, according to R. W. Graves, vice president and general manager. Construction will start within a few months in order that the extension may be ready for operation early in 1951.

The extension will be built from El Dorado, Ark., to some point on the Mississippi River. The new line will be coated and wrapped. In addition to the pump station at El Dorado there will be two booster stations. All pumping will be done by electric power.

The existing Triangle products-pipeline system is a 150-mile, 8-in. line from Carthage, Tex., via Shreveport and Cotton Valley, La., to El Dorado.

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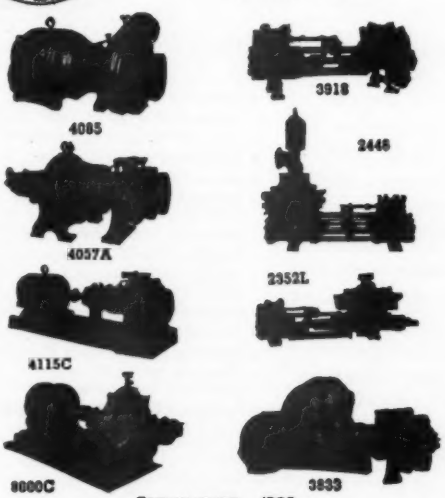

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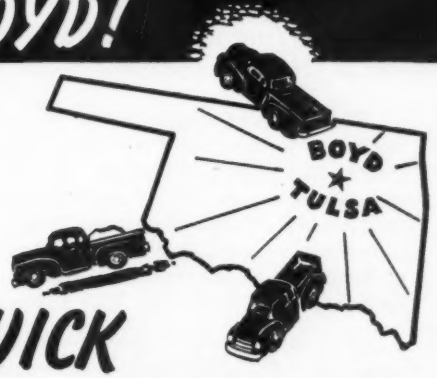

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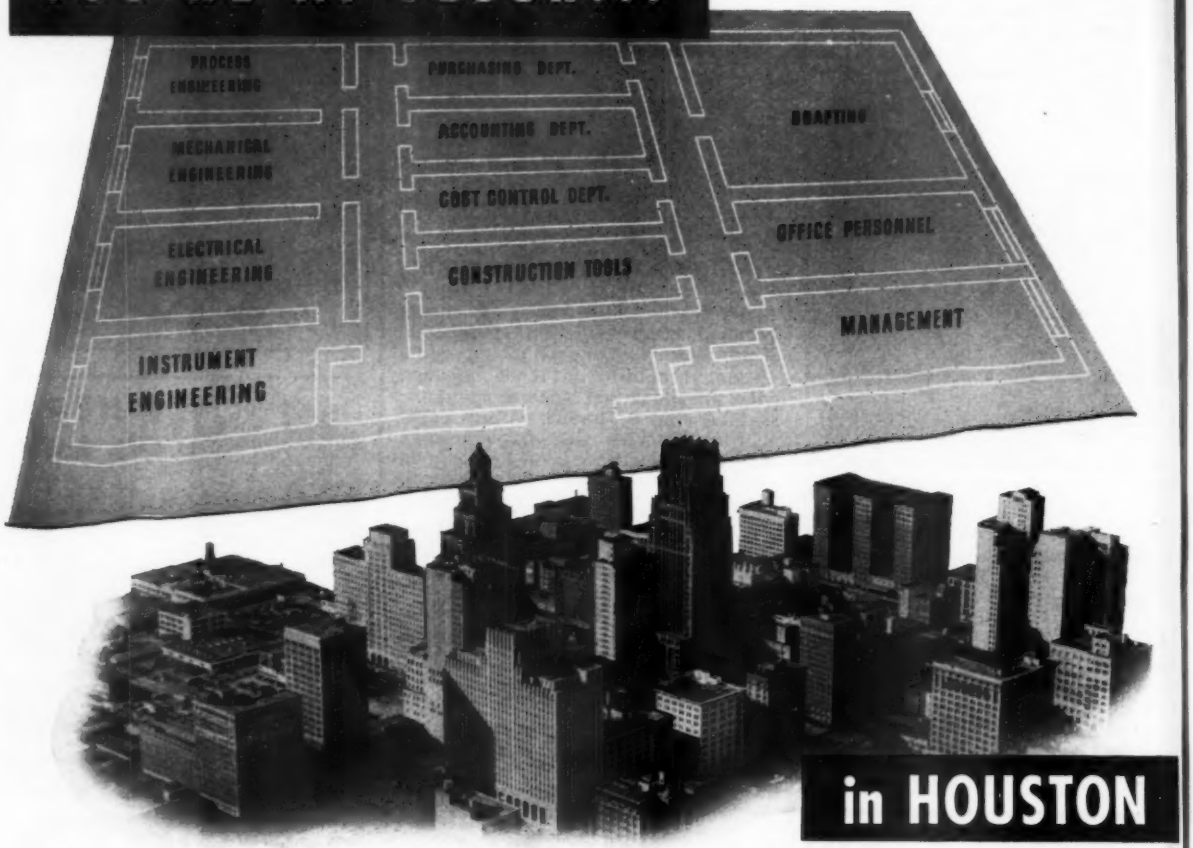

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To insure construction costs and engineering practices in keeping with current trends and to better serve the rapidly expanding Mid-Continent gas-gasoline industry, The Fluor Corporation, Ltd., established a Gas-Gasoline Division at Houston, Texas, in 1948. Manned by personnel with extensive gas-gasoline experience, this strategically located division is an organization within itself. A complete service is offered–from preliminary technical and economic studies to the design, engineering and construction of gas-treating plants, compressor stations, gasoline plants, and other facilities related to the industry.

With large storage and maintenance facilities for construction tools and equipment in Paola, Kansas, and with recourse to engineering and research talent of the entire Fluor organization, this highly efficient group combines the operational economy of a small firm with the facilities, know-how and financial security of a major company–one with national recognition and over a half century of experience.

Fluor's Houston "Box Score" since 1948

- Gasoline Plant at Denver City, Texas
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REFINING

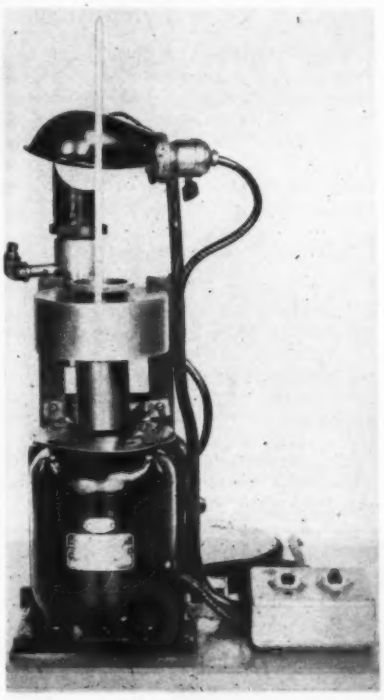
Rubber Division Formed

BARTLESVILLE, Okla. — Phillips Chemical Co., subsidiary of Phillips Petroleum Co., has formed a new rubber division as a result of consolidation of two synthetic-rubber plants.

K. S. Adams, president of the two firms, said that Phillips Chemical will take over operations of the government-owned synthetic-rubber plant near Borger, Tex., adjoining the Plains butadiene plant, which the firm designed and built for the Government during World War II, and which the company now operates.

The Plains plant produces more than 50,000 tons of butadiene annually, and substantial savings to the Government are expected through operation of the Borger plant and adjoining butadiene plant as a combined unit.

Key men who will supervise both plants are: W. C. Hewitt, plant manager; Austin Morgan, services superintendent; G. H. Short, manufacturing superintendent; and L. M. Fairman, industrial-relations superintendent.



GREASE ANALYZER.—To analyze performance of greases in ball and roller bearings over a wide range of temperatures, The Texas Co. has developed this grease-testing machine that simulates actual service conditions. By observing samples under high-speed stroboscopic light, it is possible to determine changes in quality, texture, consistency, and color, and the machine reveals grease tendencies toward seration, leakage, and breakdown through heat and prolonged use.

Cracker Contract Awarded

CLEVELAND, Okla.—Contract has been awarded to Procan, Inc., Chicago, for installation of a new cracking unit at Johnson Oil Refining Co.'s refinery here.

The new unit, to cost an estimated $750,000, will have a daily charge capacity of 1,840 bbl. Completion is scheduled for early next year.

Catalyst Plant Planned

NEW YORK.—Cracking catalysts in greater volume to service the oil industry are to be provided in a $3,000,000 plant which American Cyanamid Co. will construct in Michigan City, Ind.

Former announcement had placed the projected development in East Chicago, but the site was declared inadequate when further production demands expanded the scope of the original plans.

War demands for high-octane gasoline and the requirements of the automotive industry for more powerful fuel made it necessary for the company to change its plans.

Construction Under Way

HOUSTON.—Construction of a 2,000-bbl. distillation and treating unit is under way at the Oil & Chemical Products, Inc., New York, refinery on the ship channel here. Contractor is Delta Engineering Co., Houston.

Work is scheduled to be completed by October 1, according to W. C. Hildebrand, Jr., vice president of Anchor Petroleum Co., Tulsa, agents for the operating firm.

The expansion program is being done adjoining the 5,000-bbl. straight-run refinery formerly known as Maritime Oil Co. which had been shut down for the past year. It was leased for 5 years by Oil & Chemical Products and resumed operations on August 1, 1950. It is producing gasoline, furnace oil, diesel oil, and fuel oil. Maritime originally built the plant during 1939.

B. A. Buys Anglo Property

British American Oil Co., Ltd., has purchased controlling interest in the refining properties of Anglo-Canadian Oils, Ltd., at Brandon, Man. The local refinery has a crude-charging capacity for 2,300 bbl. per day and cracking

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and reforming capacity of 1,600 bbl. per day.

New Carbon-Black Plant

LAKE CHARLES.—Oil products for carbon black will be pipe directly from the Continental Oil Co. refinery into a $1,500,000 plant which Continental Oil Black Co. will construct here, with a designed capacity of 25,000,000 lb. yearly.

Contracts for the development have been let and formal announcement has been made following action by the Louisiana Board of Commerce and Industry in approving a 10-year tax exemption on the property. *(The Oil and Gas Journal, September 21, 1950, page 177.)*

Organization of Continental Oil Black Co. was announced by L. F. McCollum, president of Continental Oil Co., and R. I. Wishnick, president of Continental Carbon Co., joint owners of the new enterprise.

Production by the plant is scheduled to start early in 1951 to meet the increased war demand for high-abrasion carbon black on "cold rubber" products. The recent government directive to conserve the use of natural rubber has stimulated the market in high-abrasive carbon black, and a portion of the new plant's output may be funneled into the expanded synthetic-rubber production along the Gulf Coast.

Lube Production Up

TULSA.—Production of lubricating oils in the Mid-Continent area advanced sharply in July over year earlier figures and stocks on hand were down, according to statistics released by Western Petroleum Refiners Association.

July production reached 1,621,412 bbl., representing a 66.3 per cent increase over the same month last year. Stocks on hand at the end of July were 1,250,189 bbl., a drop of 19.9 per cent from the total reported for July 1949.

The statistics were based on reports from 14 companies for 1950, and 13 companies for 1949.

Shipments, both domestic and export, totaled 1,731,194 bbl., up 63.6 per cent from the same month last year. Domestic shipments for the month totaled 1,558,373 bbl., a gain of 55.2 per cent; exports rose 119,005 bbl., to 172,821 bbl.

A.I.Ch.E. Plans Symposium

NEW YORK.—The New York section of the American Chemical Society has scheduled an all-day "Symposium on Radioisotopes" to be held in the Hotel Statler, New York City, Friday, January 19, 1951. A complete program for the symposium will be published at a later date.

Packing-Problems Meeting

NEW YORK.—An all-day session on problems of packaging petroleum products is planned by the petroleum committee of Packaging Institute at the Commodore Hotel here October 24. Chester Reed, The Texas Co., chairman of the petroleum committee, will preside.

The meeting will be a portion of the 3-day twelfth annual forum of the Packaging Institute.

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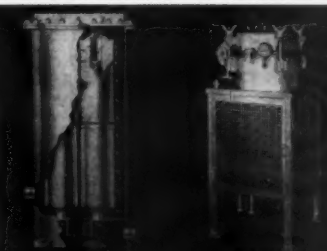

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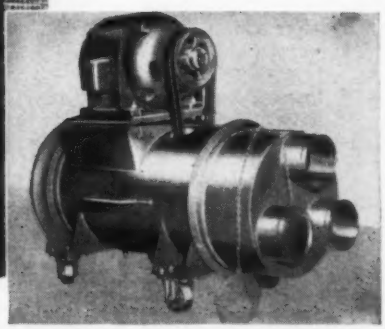

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Among the Drilling Contractors

Delta Starts Work at Two Deep Texas Tests

Delta Drilling Co., Tyler, Tex., has two deep wildcat tests under way in Madison County, East Central Texas. One, projected to 10,000 ft., is being drilled for J. M. West. It is 1 W. S. McMahan, in the Z. Robinson Survey, 9 miles southwest of Madisonville. The other, scheduled to go to 11,000 ft., is being drilled for the contractor's own account. It is 1 W. T. Walsh Estate, located in the James Mitchell Survey, 3½ miles south of Midway.

New Drilling Company

Al W. Cherry, Evansville, Ind., and C. C. Beebe, recently of Muskogee, Okla., have organized the Cherry-Beebe Drilling Co. The new company will engage in contract drilling and oil development work in the tri-state area of Illinois, Indiana, and western Kentucky. Headquarters have been established at Evansville.

Cashion Opens New Office

Llye Cashion, Inc., drilling contractor and operator, Laurel, Miss., has established additional offices at Jackson, Miss., with N. R. Miller, Jr., as manager.

Peterson Drilling Co., New Orleans, is starting a wildcat test 2½ miles southwest of Coles, Wilkinson County, Mississippi. The test, 1 Crosby, is being drilled as a joint venture of the contractor and John Lander, independent operator. Location is given as the C SW SE 2-3n-1e.

Murfin Drilling Co., Wichita, has a string of cable tools running in southwestern Iowa, where it is drilling a rank wildcat test for Council Bluffs Exploration Trust Co. Location of the test, 1 Thieshafer, is in the SE SE SE 6-73n-43w, Mills County.

Tri-State Drilling Co., Midland, Tex., is starting a 5,500-ft. wildcat test for Cabot Carbon Co. at 1 J. W. Watson, in Block D, J. H. Gibson Survey, 6 miles northeast of Plains, Yoakum County, West Texas.

N. V. Duncan, Oklahoma City, is the contractor on a 4,000-ft. test being started 4½ miles of Stillwater, Payne County, Oklahoma, for C. L. McMahon, Inc., at 1 Wolff, NW NE NE 15-19n-3e. The location is only about 2 miles northeast of where **Deep Fork Drilling Co.,** Tulsa, is drilling another wildcat for Wilcox Oil Co. at 1 Focht, NE SW NW 20-19n-3e, and about 1½ miles southeast of where **Mora Drilling Co.,** also of Tulsa, is drilling for W. H. Elson at 1 Hesser, NE NE SW 4-19n-3e.

Parker Drilling Co., Tulsa, has contracted for a 10,500-ft. wildcat test to be drilled for A. A. Cameron and others in the C SW NW 36-11n-22w, 2 miles northwest of the most westerly production in the Elk City field, Beckham County. Rig is being moved in.

Burnett Drilling Co. has moved a rig to a wildcat location 2 miles north of Douglasville, Cass County, East Texas, where it has the contract for a 6,500-ft. test to be drilled for McAlester Fuel Co. at 1-A Harry Golden Estate, in the William F. Weatherly Survey.

Kemp Drilling Co., Shreveport, has the contract for a 7,000-ft. Wilcox sand test which Placid Oil Co. is starting at 2 U.S.A., in 55-5n-1w, 4 miles east of Kingston, Adams County, Mississippi.

Donnell Drilling Co., Odessa, Tex., has a rig working for General American Oil Co. on a wildcat location in Section 61, Block 7, H&GN Survey, Kent County, West Texas, where it is drilling a projected 7,000-ft. reef test.

Claude J. Winkler, Chanute, Kans., owner of Claude J. Winkler Drilling Co., now is operating in Washington County, Oklahoma, where he is running three rigs in a water-flood project.

Justiss-Mears Oil Co., Jena, La., has taken a contract for a 3,600-ft. test to be drilled for Shelton Development Co. in the NEc 13-20n-8e, 5 miles southeast of Bonita, West Carroll Parish, Louisiana.

Crow Drilling Co., Shreveport, is the contractor on Sunray Oil Co.'s latest test in the Driscoll gas field, Bienville Parish, North Louisiana. The test is 1-B Davis Lumber Co., in 15-16n-5w. Objective is the Travis Peak.

Among the latest contracts taken by **Santa Fe Drilling Co.,** Santa Fe Springs, Calif., are those for the second test which Ohio Oil Co. is starting in the Santa Ynez area, Santa Barbara County, California, and an-

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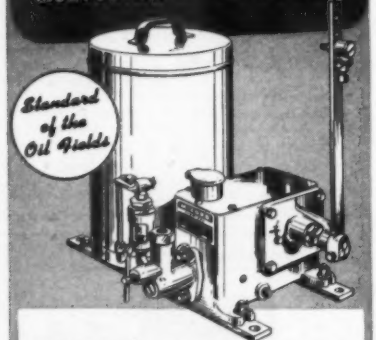

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other wildcat venture which Shell Oil Co. is undertaking in the Padre Canyon area, Ventura County. Ohio's test is 2 Santa Ynez Unit, in 6-5n-29w. The first test on this unitized block was unsuccessful. Shell's venture is 2-1 Hobson-Smith, in 15-3n-24w..

Gene Reid Drilling, Inc., Bakersfield, Calif., is the contractor on the first of several wells projected by Fullerton Oil Co. in the Tapo Canyon area, Ventura County, California. The initial test, a wildcat, is 1 N. L. & F. Co., in 36-4n-18w.

Marken & Grannell is the contracting firm on a 7,500-ft. test being started by National Associated Petroleum Co. on the Decker prospect in Big Horn County, southern Montana. The test is 1 Dinnenn-Government, SW SE 21-8s-41e.

Vernon Whitely Drilling Co. is the contractor on a wildcat test which A. G. Phillips and associates are starting in the J. E. Allen Survey, 2 miles southwest of Quitman, Wood County, East Texas. The test, 1 H. S. Cathey, is scheduled to go to 5,500 ft.

Winn Hawkins Drilling Co. is starting a test in the Bancroft field, Beauregard Parish, Coastal Louisiana, for Natural Gas & Oil Corp. and associates. Location for the test, 1 Columbia, is in 9-6s-13w.

Southern Six Drilling Co., Baton Rouge, La., is drilling for Dave Haas and associates at a wildcat location in 42-5s-3e, northwest of Opelousas, western St. Landry Parish, Louisiana. Location is on the Paul Joubert lease.

Holmes Drilling Co., Houston, has a rig running on a wildcat location southeast of Bonney, Brazoria County, Texas Gulf Coast. The test, 1 Ethel R. Coop Estate, Warren D. C. Hall Survey, is being drilled for the contractor's own account. Projected depth is 7,750 ft.

ROTARY RIGS IN OPERATION*

(United States and Western Canada)

Area—	Week ended 9-18-50	Change week ended 9-11-60	9-19-49
Gulf Coast	510	—16	— 35
W. Tex.-N. M.	746	—24	+214
Ark.-N. La.-E. Tex.	143	+ 7	— 8
Oklahoma	263	—15	+ 59
Kansas	†151	+19	+ 37
Illinois-Eastern	122	+ 6	+ 12
Rocky Mountains	121	— 5	+ 16
Pacific Coast	143	+ 7	— 25
Total. U. S.	2,199	—21	+270
Western Canada	101	+ 5	+ 34
Total	2,300	—16	+304

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the Rocky Mountain and Western Canada areas are shown by charts on pages 302 and 303. †Includes operating rigs in Nebraska.

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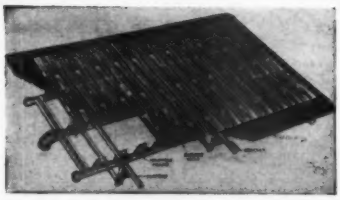

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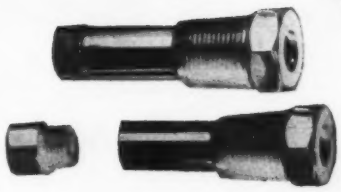

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Pipe Size	Floor to Floor
½"	16 sec.
¾"	16 sec.
1"	19 sec.
2"	27 sec.
2½"	35 sec.
3"	43 sec.
4"	76 sec.

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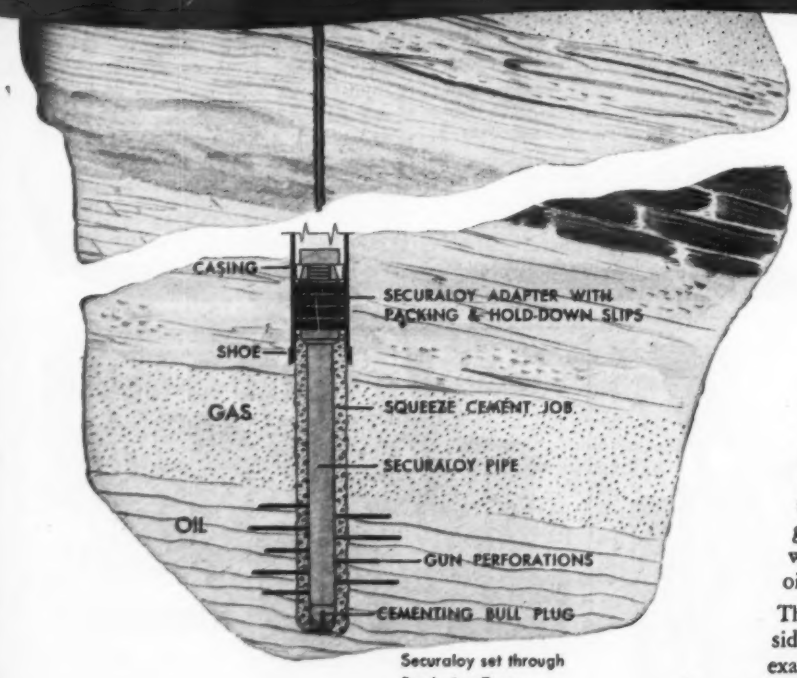
QUESTION: How to increase production and lower gas-oil ratio by a simple and satisfactory remedial method

Too much gas—Too little oil?



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This operator first tried a plastic squeeze job, but the well still made only 6 barrels per day. Then a cement squeeze job was performed, with the entire open hole left full of cement and then drilled out. This proved unsuccessful too!

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Exploration and Drilling

Northwestern Oklahoma Activity

ONCE again activity is picking up in northwestern Oklahoma. Ringwood, northwestern Oklahoma's first major oil field, is being developed at a rapid rate and is now expected to ultimately embrace a roughly rectangular area about 6 by 9 or 10 miles. Alfalfa County appears to have its first commercial oil well in Cecil Davis et al 1 Glidewell, SW SW NE 14-24n-11w, now testing the Oswego. George W. Deck and Olson 1 Morris, NW NW SW 27-25n-9w, another Alfalfa County wildcat, is drilling in the Mississippian.

There are two wildcats drilling in Ellis County: Sunray Oil Corp. et al 1 Hanan, C SE NW 1-19n-24w, is drilling below 13,000 ft. on this proposed 14,000-ft. test which has yielded only disappointing results to date, and is running much lower than anticipated. Sinclair Oil & Gas Co. 1 D. L. Berry, C SE NW 14-24n-24w, now drilling around 9,500 ft. without having encountered more than small shows of oil and gas up the hole. In Harper County, HER Drilling Co. has set pipe at 6,558 ft. in an abandoned hole, the 1 Harrison-Selman, C NE SE 22-26n-20w, to test an upper Mississippian horizon. Amerada Petroleum et al 1 Federal, C NW SE 3-22n-13w, a wildcat in Woods County, has been staked. This wildcat is to test the Wilcox. Roger Mills County is the scene of major lease play.

Such activity in an area which until recently has given so little encouragement, shows that there are still some geologists and other oil men who have faith in this area. The geologists who see a great future for northwestern Oklahoma as an oil-producing province are definitely in the minority. Most geologists are lukewarm on the area, and some condemn it outright.

Many once condemned areas are now the country's biggest producers, and the reasons given for why there will not be oil in a sedimentary section are generally short lived. Perhaps the reasons why there can be oil, as presented by the geologists who see a great future for a "condemned" area, are just as wrong as the negative ones, but the fact remains that it is those with faith in the area, regardless of their reasoning, who find oil where others said that it would not be found.

Northwestern Oklahoma, here considered as embracing Harper, Woods, Alfalfa, Ellis, Woodward, Major, Roger Mills, and Dewey counties, is in two geological provinces. Woods and Alfalfa counties, and most of Major County are on what is generally referred to as the Northern Basin Shelf, and the other counties are on the north flank of the Anadarko basin.

Little is known of the Northern Basin Shelf, and even less of the flank area. The possibility of finding oil accumulations in the counties of the shelf area is more generally accepted in geological circles than the belief that the counties to the southwest will produce. Holes drilled in the flank area have indicated that porosity is poor in the horizons that are big producers to the east, and that closed structures and stratigraphic traps formed by unconformities in the Pennsylvanian and older rocks are unlikely. In the shelf area it is probable that facies changes forming in the Pennsylvanian, especially in the upper Layton, Oswego, and Prue, may create traps. Also, there is evidence of early folding that makes the possibility of structural oil in the pre-Pennsylvanian horizons, especially the Hunton and Wilcox, attractive.

Exploratory work in northwestern Oklahoma has been retarded in the past by the inability to develop reliable surface or subsurface structure maps, due to the nature of the surface and shallow sediments, and by difficult drilling conditions. However, the industry has made a great deal of progress in the last 15 years and it could be that it is now ready to turn northwestern Oklahoma into a major oil-producing province. It is unlikely that Ringwood would have been found 15 years ago—the industry wasn't ready for it. Horizons capable of producing may have been passed up in some of the deeper wildcats in the area, because of the want of modern drilling techniques and modern subsurface study aids.

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—In southwest Ector County, Amerada 1 Carlinville National Bank, Section 46, G&M Survey, 7 miles southwest of Judkins, extended Ellenburger production almost 1 mile south of Yarborough & Allen field, and had given the same field a new pay in the Waddell sand of the Simpson. A 4-hour test in the Ellenburger from 10,384-480 ft. (calculated 400 ft. above the water), recovered 2,290 ft. of clean oil. From the Waddell section, which does not produce in Yarborough & Allen field, the well flowed 171 bbl. of 42°-gravity oil in 7 hours.

SOUTHWEST TEXAS.—Pettus and Yegua sands have been tapped in Amargosa field of Jim Wells County at George W. Graham 1 Lester Moore, N. Gussett Survey 98, Abstract 185. Pettus was perforated from 5,750-56 ft. and tested approximately 8 bbl. of condensate to each million cubic feet of gas. Yegua sand was perforated from 5,989-90 ft., and flow was 70 bbl. of 50°-gravity condensate through 10/64-in. choke.

ROCKY MOUNTAIN AREA.—Shell Oil Co. is plugging back to Muddy, which flowed oil on tests, at its Buckingham, Colo., discovery. Continental Oil Co. has completed two new pay areas in the Sussex-Meadow Creek district, Wyoming. Amerada Petroleum Corp.'s ninth well at Sage Spring Creek, Wyoming, flowed on tests for the best well in the area.

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California

Drillers Fear Steel Pinch May Curtail Development

LOS ANGELES.—While there has been no noticeable trend in that direction as yet, development drilling in California fields during the last quarter of the year is expected to show a slight decrease because of lack of casing and other tubular goods.

Though believed to be only temporary in duration, some companies state they are having almost as much difficulty in securing tubular goods as they did during the worst periods of the last war. Their belief that the situation would be remedied within the next few months was based on the expectancy that the West Coast industry's pipe quota would be increased.

Activity in the Cuyama is one of the first to be affected. In that area Richfield Oil Corp. plans to curtail its drilling by over 40 per cent, cutting the number of rigs it is using from 14 to 8 strings. Most of the curtailment will be in South Cuyama where the company has been using 11 contract rigs in development work.

Latest report of the state Division of Oil and Gas showed that during the week ended September 16, 44 notices to drill had been filed of which all but 10 were field wells. This number is in line with proposed work shown in reports of the past 2 months. So far this year there have been 1,300 notces filed as against 1,863 at the same date in 1949.

In northwest Cuyama, Universal Consolidated Oil Co. 55-31 Humble, a southeast offset to the Hancock-Bishop discovery on shallow markers appeared to be running about 130 ft. higher on structure than the discovery well. Oil-sand stringers were topped at 1,850 ft. and 2,150 ft. A test of the Dibblee sand in the interval 2,434-2,500 ft. yielded a steady gas blow and when drill pipe was pulled some 225 ft. of oily, gassy mud was recovered. Last reports showed the well drilling at 2,749 ft. toward the 5,600-ft. pay found in the discovery well.

Another development for the new area, in the center portion of Section 31-32s-20e, was the staking of a south offset to the pool opener. It will be Richfield 45-31 Howard. About ½ mile to the northwest the Universal 81-36 Humble was drilling below 4,720 ft.

Also in the northwest Cuyama area, and ½ mile west of production in the new Morales-Clayton pool, oil shows were encountered at Pearson & Steffen 81-9 "Well." The wildcat, in extreme northeast Section 9-11n-28w, drilled through a fault at about 1,217 ft. Cores from 1,305-25 ft. found the Morales sand carrying some oil. At the week end the wildcat was continuing to core below 1,410 ft.

King County's gas areas will be tested by two new wildcats. In the Tulare Lake basin area, Rowan Oil Co. will drill a 4,000-ft. test in Section 9-22s-20e. Called the 1 Crockett & Gambogy, the test is 10 miles northwest of nearest gas production, in Harverster field. Second wildcat is a ½-mile stepout to the west of production in Trico field, to be drilled by Trico Oil & Gas Co. as its 1 Lewis Community in SE Section 2-24s-22e.

CALIFORNIA WILDCAT FAILURES

Kern County, Panama Project area: Western Gulf Oil Co. 16-23 KCL Panama, 23-30s-26e, dry, TD 8,710 ft., elev. 240 ft.

Peso Creek area: Pacific Oil & Gas Development Corp. 81-A Glide, 13-27s-27e, dry, TD 2,709 ft., elev. 1,081 ft.

Round Mountain area: Hoover Drilling Co. 1 Balsher, 32-28s-29e, dry, TD 2,594 ft., elev. 718 ft.

Round Mountain area: Macmillan Petroleum Co. 1 KCL, 13-28s-28e, dry, Pyramil Hills 2,150 ft., Vedder 2,257 ft., TD 2,287 ft., elev. unknown.

Santa Barbara County, Cuyama Valley area: Garten Exploration Co. 1 Dr. Garten, dry, TD 2,076 ft., elev. 2,860 ft.
San Bernardino County, Hesperia area: Rex Oil Co. 1-B Justice, 13-4n-5w, dry, TD 3,096 ft., elev. 3,500 ft.
San Joaquin County, Mandeville Island area: Shell Oil Co. 1 Mandeville Island, 16-2n-4e, dry, TD 6,983, elev. 7 ft.
Tehama County, Hooker Dome area: Hooker Dome Syncate, Ltd., 1 Cassidy, 12-28n-42, dry, TD 4,477 ft., elev. 790 ft.
Ventura County, Simi area: Regent Oil Co. 1 Runkle, 14-2n-17w, dry, TD 3,247 ft., elev. unknown.

CALIFORNIA SUCCESSFUL WILDCAT

Kern County, Fruitvale area: Campbell-Shell & Collins 1 Stockdale-KCL, 3-30s-27e, completed for 106 bbl. per day rate of 19.6°-gravity crude from perforations at 4,270-4,395 ft., ¾-in. flow bean, 368 bbl. per day rate gross, 1,080 psi. tubing pressure, TD 4,395 ft., elev. 403 ft., ½ mile south extension to Fruitvale field.

Louisiana-Arkansas

Longwood's Cotton Valley Test Tops Objective

SHREVEPORT.—Phillips Petroleum Co. 1 Longwood, 32-19n-16w, Cotton Valley test in Longwood field of Caddo Parish topped that formation at 7,770 ft., on elevation of 279 ft., and was drilling ahead below 7,818 ft. in shale. Tests and surveys had not been reported, and the top was from samples.

Skelly Oil Co. 1 Williamson, 9-19n-16w, Caddo wildcat, was drilling shale and limestone of the lower Glen Rose at 5,521 ft. Location is 2 miles west of Mooringsport field.

Continental Oil Co. 1 Wideman, 21-21n-7w, Claiborne Parish wildcat, had total depth at 8,500 ft. and was running electrical surveys.

Northwest of Lisbon field, Ray & Woolf 1 English, 8-21n-5w, total depth at 5,820 ft., in the Travis Peak, and was waiting on orders. A core from 5,247-79 ft. recovered hard lime with slight oil shows. A 20-minute drill-stem test from 5,548-86 ft., recovered 4,000 ft. of salt water.

Lyons, Prentiss & McCord 1 Sue Chaffin, new Paluxy wildcat located 5 miles northwest of Mansfield in SW SW SE 4-12n-14w, DeSoto Parish, was drilling in the lower Cretaceous at 3,250 ft. Lime and shale with light-oil shows were cored at 2,778-2,828 and 2,928-68 ft.

In Grant Parish, Justiss-Mears 1 Erwin, 27-6n-2e, was said to be pumping an estimated 50 bbl. of oil a day, plus considerable salt water, from the Sparta zone at 2,424-30 ft. Total depth was 5,205 ft., in the Wilcox.

In Lincoln Parish, Carter Oil Co. 1 W. E. Dowling, NE SW 19-18n-4w, 2 miles west of Simsboro, was in the lower Cretaceous at 5,200 ft. It was projected to the Travis Peak.

Marine Oil Co. 1 Montgomery, new Tussaloosa wildcat in NE SW NW 13-15n-9e, Madison Parish, was drilling shale at 5,150 ft. Location is 2 miles northwest of Indian Lake field.

NORTH LOUISIANA SUCCESSFUL WILDCAT

Concordia Parish: Sinclair Oil & Gas Co. 1 A. H. Campbell, 7-5n-9e, TD 7,007 ft., perf. 6,326-29 ft. in the Wilcox, IP flowed 288 bbl. fluid, 20 per cent sediment, balance 45°-grav. oil, ¼-in. choke, TP 400 psi., GOR 330 cu. ft.; new field called Esperance Point.

NORTH LOUISIANA WILDCAT FAILURES

Caddo Parish: J. D. Collins 1 W. A. Caplis, 6-16n-12w, dry, TD 4,562 ft.
Concordia Parish: R. A. Campbell 1 Con-

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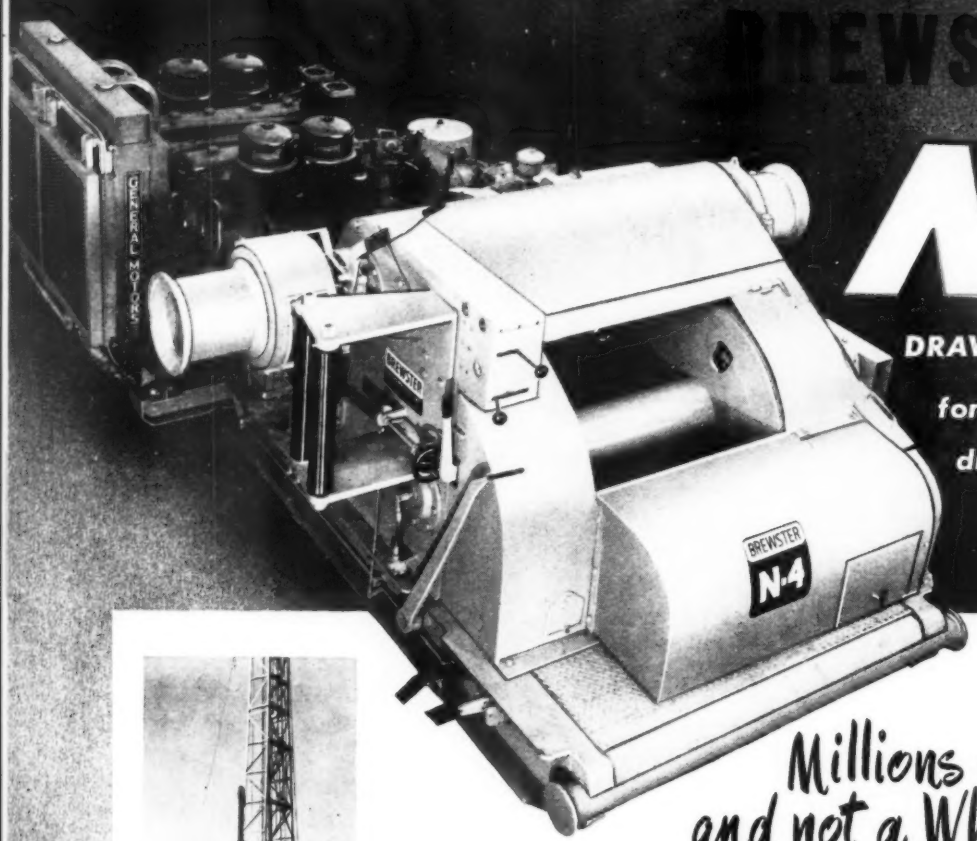

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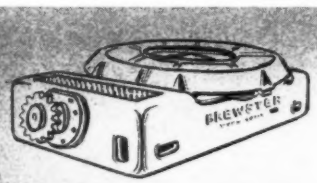

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cordia Bank & Trust, 32-8n-9e, dry, TD 6,110 ft.

Richland Parish: Duerr & Bolin Co. 1 Fry & Lutiker, NW NE 21-15n-5e, dry, TD 3,720 ft., elev. 68 ft., Cane River 720 ft., Wilcox 880 ft., Midway 2,032 ft., Cretaceous chalk 2,571 ft., Austin chalk 2,660 ft., Eagleford 2,780 ft., sand 2,940-76 ft., Tuscaloosa 2,976 ft., Marine Tuscaloosa 3,337 ft., basal sand 3,564-3,702 ft., base Tuscaloosa 3,702 ft., Paluxy top 3,702 ft.

Webster Parish: James Muslow 1 F. H. Drake, NW NW 12-19n-10w, dry, TD 4,515 ft.

ARKANSAS WILDCAT FAILURE

Lafayette Parish: Lion Oil Co. 1 Olivia, NE SW 17-77s-24w, dry, TD 9,174 ft., elev. 270 ft., Massive anhydrite 4,578-4,741 ft., Travis Peak 5,683 ft., Cotton Valley 6,930 ft., Buckner 8,916 ft., Smackover 9,096 ft., Reynolds 9,107 ft., porosity 9,128 ft.

NW 15-19s-12w, IP 282 bbl., Lansing-Kansas City, 3,167-75 ft., TD 3,447 ft.

Alpine 1 Kowalsky, SE SE NW 20-19s-11w, IP 361 bbl., Lansing-Kansas City, 3,080-116 ft., TD 3,376 ft.

Alpine 1 Hartman, SE SE NE 28-19s-11w, IP 31 bbl., Arbuckle, 3,3242-50 ft., TD 3,350 ft.

Greenwood County: E. L. Edwards 1 Kimball, SW NW NW 28-24s-11,e IP 12 bbl., Mississippian, 1,673-76 ft., TD 1,676 ft.

Pawnee County: Brack Oil Co. 1 Hankin, NE NE SW 4-20s-16w, IP 2,700,000 cu. ft. gas, Arbuckle, 3,708-79 ft., TD 3,719 ft.

Russell County: Lewis Mai 1 Fox, SE SE SE 22-13s-14w, IP 96 bbl., Arbuckle 3,263-84 ft., TD 3,284 ft.

Woodson County: Scott et al 1 Heimple, NW NE NW 9-24s-14e, IP 25 bbl., Mississippian 1,706-12 ft., TD 1,717 ft.

KANSAS WILDCAT FAILURES

Barton County: Derby Drilling Co. 1 Prosser, SE SE SW 17-16s-12w, dry, TD 3,410 ft.

National Associated Petroleum Co. 1 Selle, SW SW SE 10-20s-13w, dry, TD 3,566 ft.

Butler County: Morrison 1 Corfman, SE SE NW 14-25s-4e, dry, TD 2,800 ft.

Coffey County: Sunflower et al 1 Barr, NW SE SE 33-22s-14e, dry, TD 1,705 ft.

Ellis County: A. W. Ault 1 Rock, SW SW SW 2-15s-19w, dry, TD 3,746 ft.

G. M. R. Oil Co. 1 Rome, CEL NE NE 19-13s-16w, dry, TD 3,514 ft.

Graham County: Hansen 1 Lewis, NW NW NW 15-10s-21w, dry, TD 3,935 ft.

National Coop. 1 Eichman, SE SE NW 32-9s-21w, dry, TD 3,935 ft.

Jones, Shelburne & Farmer 1 Wiltrot, SE SE SW 15-6s-21w, dry, TD 3,842 ft.

Jowell County: A. E. Allison et al 1 DeBay Brothers, SE SE SE 11-5s-10w, dry, TD 4,204 ft.

Lyon County: Scanlon & Dillard 1 Welch, NE NW 31-20s-10e, dry, TD 2,539 ft.

Kansas

Second Fall Creek Well Shows Oil in Two Zones

DEEPENED from Viola lime where a drill-stem test, previously reported, gave indications of prolific production, The Texas Co. 2 Hoffisiefken, NE SW SW 3-35s-3w, first confirmation well for the recently opened Fall Creek pool, west of Caldwell, southern Sumner County, has found additional good oil showings in the Simpson, productive zone of the discovery well, 1 Hoffisiefken.

Simpson was checked at 4,711 ft. (—3,603 ft.), and drilled to a total depth of 4,755 ft. A drill-stem test taking in the bottom 12 ft. (4,743-55 ft.) had gas at the surface within 11 minutes after the tool was opened and yielded 145 ft. of heavily oil and gas-cut mud in the pipe break-down. Tool was open 60 minutes. Operators have run 7-in. oil string to 4,717 ft. for completion.

In a previous drill-stem test at 4,700-10 ft., in Viola, the well got a good oil flow lasting 50 minutes after the tester was closed. Tool was open only 30 minutes and oil was at the top in 20 minutes. The well is a location southwest of the discovery well, which established a maximum potential (3,000 bbl. per day) from the Simpson at 4,746-49 ft.

Continental Oil Co. 1 Cavin, SW SW NW 29-33-11, which is opening a new Mississippian pool in southeastern Barber County, has been deepened another 31 ft. in its pay zone to a total depth of 4,616 ft., where in a swabbing test it produced 91.77 bbl. of oil in 24 hours. Previously, at a total depth of 4,585 ft. it swabbed at the rate of 40 bbl. of oil per day. Hole is open from 4,570 ft., with top of the Mississippian at 4,494 ft. (—3,076 ft.). The discovery is just south of the Gerlane townsite and 2½ miles southwest of the Rhodes pool, opened last year.

Extension of production in the active and rapidly expanding Cheyenne View pool, Barton County, another ¾ mile to the north is indicated by good showings encountered by Aladdin Petroleum Corp. and Crowe Drilling Co. in their 1 Habiger, SW SW NW 1-19-12. Showings were in the conglomerate zone, topped at 3,387 ft., where, n a drill-stem test at 3,389-3,405 ft., 450 ft. of clean oil was recovered. Casing was run to the top of the interval tested, and after plug was drilled out the hole filled with oil. Swabbing is under way.

B-H-P Oil Co. 1 Eulert, SW SW NE 26-11-15, ¾ mile north of the Eulert pool, Russell County, found good saturation in Arbuckle lime, topped at 3,369 ft. (—1,482 ft.), and drilled to 3,373 ft. Casing has been cemented 2 ft. in the top of the pay. The well is separated from the pool by a dry hole.

KANSAS SUCCESSFUL WILDCATS

Barton County: Alpine 1 Schartz, NE NE

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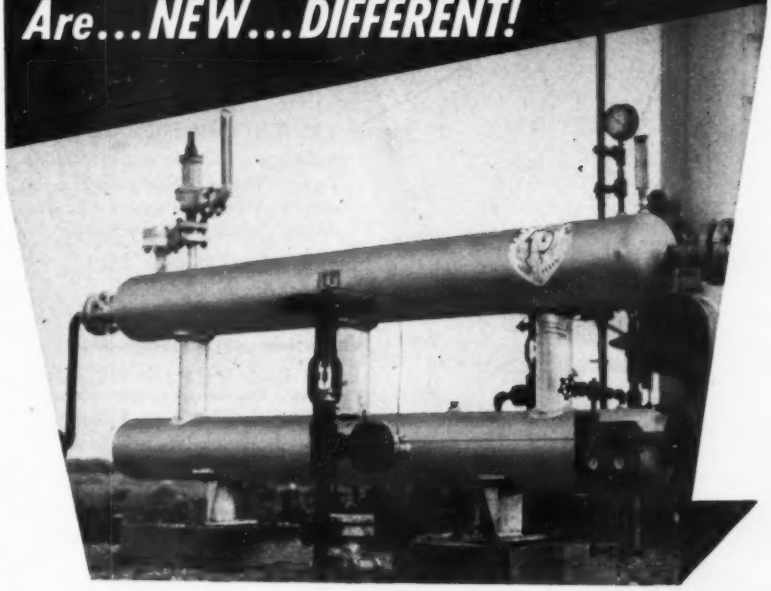

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McPherson County: Mallard Drilling Co. 1 State, NE NE SE 21-18s-1w, dry, TD 2,810 ft.

Mallard Drilling Co. 1 Messinger, NE NW 5-18s-1w, dry, TD 2,783 ft.

Rice County: Ash & Murfin 1 Schulz, SE NE NE 15-18s-10w, dry, TD 3,298 ft.

Russell County: Wakefield 1 Bender, SE SE NW 12-15s-15w, dry, TD 3,277 ft.

Rush County: Brack Oil Co. 1 Bayer, NW NW NW 35-18s-18w, dry, TD 3,817 ft.

Sheridan County: Musgrove 1 Sideslinger, SE SE SE 36-6s-27w, dry, TD 4,440 ft.

IOWA

Council Bluffs Oil Exploration Trust 1 Thieschafer, SE SE 6-73n-43w, Mills County, 7 miles south of Council Bluffs, is drilling below 700 ft. The closest production to this wildcat is in the Falls City, Nebraska, area, about 85 miles south. The hole is to be carried to granite expected at 2,250 ft.

Southwest Texas

Two New Pays Topped In Amargosa Field

CORPUS CHRISTI.—Two new pay sands have been tapped in Amargosa field of Jim Wells County, at George W. Graham 1 Lester Moore, N. Gussett Survey 98, Abstract 185. The Pettus sand, topped at 5,748 ft., was perforated from 5,750-56 ft. and tested approximately 8 bbl. of condensate to each million cubic feet of gas. Operator perforated the Yegu sand from 5,989-90 ft. and flow was approximately 70 bbl. of 50°-gravity condensate through 10/64-in. choke. Bottomhole flowing pressure was 1,800 psi.

Humble Oil & Refining Co. tested gas-condensate at 8,258-67 ft. in its 1 Robert J. Kleberg, Jr., Trustee, Quiteria Pasture wildcat in Brooks County. Operators are running casing for production test. The hole was drilled to a total depth of 9,250 ft., then plugged back to 8,267 ft. The open-hole test was run at 8,258-67 ft., recovery being 300 ft. of slightly condensate-cut water. The well is located in Santa Quiteria Grant, approximately 2 miles south-southwest of Humble 1 Kleberg Trustee, Viboras Pasture, gas discovery.

Union Producing Co. 2 Virginia H. Tatton, confirmation well to the new Virginia pool, Aransas County, as well as a new pay opener, flowed 320 bbl. of 54.8°-gravity oil per day through ⅛-in. choke. Production is through perforations at 10,993-11,008 ft. Tubing pressure was 4,060 psi., with the casing sealed.

La Gloria Corp. is coring ahead below 8,725 ft. in its 1 J. H. Harvey, wildcat test 3½ miles north-northeast of Gregory, San Patricio County, after testing gas-condensate at the 8,600-ft. level. The well developed 510 psi. working pressure in drill-stem test open 8 minutes from 8,60116 ft., using ¼-in. and 1-in. chokes, and recovered 60 ft. of 51°-gravity condensate. Bottomhole flowing pressure was 2,650 psi. Drill-stem test below this section at 8,662-71 ft. recovered salt water.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Aransas County: New pay at Virginia—Union Producing Co. 2 Virginia H. Tatton, John Durst Sur., A-51, top pay 10,993 ft., TD 11,135 ft., perf. 10,993-11,008 ft., IP: 321 bbl. oil per day, ⅛-in. choke, 54.8° gravity, TP 4,060 psi.,

McMullen County: New pay at Hagist Ranch—Stanolind Oil & Gas Co. B-1 Hagist Ranch, Inc., BBB&CRR Co. Sur. 3, 3 mi. W of Loma Alta field, TD 8,023 ft., top pay 7,125 ft., perf. 7,125-40 ft., IP: 1,275,000 cu. ft. of gas per day, plus ungaged amount of condensate, 54.5° gravity, TP 975 psi., CP 1,575 psi.

San Patricio County: New pay at Sinton—Billy Bridewell and W. G. Darsey, Jr., 1 S. J. Lewis, Farm Lot 32, M. J. de la Garza Sur., top pay 5,106 ft., TD 5,312 ft., perf. 5,108-14 ft., IP: 172 bbl. oil per day, 10/64-in. choke, 30.2° gravity, TP 600 psi., CP 800 psi.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Caldwell County: Trio Oil Co. 1 James E. Ferguson, James S. Montgomery Sur., 2 mi. NW of Lytten Springs, dry, TD 1,219 ft.

Duval County: Continental Oil Co. 1 C. G. Glasscock et al, Blocks 11 and 12, L. J. Harts Subd., F. Cordente Heirs, Santa Cruz de Concepsion Gr., A-173, 7 mi. NE of Sejita, dry, TD 6,000 ft.

Frank Frohnhoefer 1 Frank C. & Clyde M. Allen, Las Anacuas Gr., A-627, 16¼ mi. S-SW of San Diego, dry, TD 6,046 ft.

Jim Hogg County: O. W. Killam 1 Moody Cotton Corp., Sur. 299-1, 7½ mi. SW of Hebbronville, dry, TD 4,204 ft.

O. W. Killam 2 Moody Cotton Corp., Sur. 210, 6 mi. E of Las Animas field, 7 mi. SW of Hebbronville, dry, TD 4,266 ft.

Maverick County: William L. Clary 1 Dr. J. W. Weeks, Anastacio Carr Sur. 39, A-75, dry, TD 1,202 ft.

McMullen County: John F. Camp & Sons et al 1 T. J. Martin & H. H. Freyette, J. Corona Sur. 66, A-1,125, 5 mi. NE of Seven Sisters, dry, TD 2,415 ft.

B. C. Clardy & L. O. Kelsey 1 William Hubberd, AB&M Sur. 181, A-507, 13 mi. N of Freer, dry, TD 1,771 ft.

San Patricio County: Callery & Hurt, Inc., 1 H. G. Richie, Sec. 40, Fourth Subd. of Taft Farm Lands, 9 mi. NE of Taft, dry, TD 9,019 ft.

Williamson County: Amos Peters, Louis C. Anderson, Herbert Burns and M. Sorenson 1 O. H. Krueger Est., John Pharrass Sur., 4½ mi. NE of Taylor, dry, TD 1,130 ft.

H. J. Stewart 1 Gotleb Riethmayer, Peter Cartwright survey, 8 mi. SE of Taylor, dry, TD 1,275 ft.

Zavala County: David S. Ring 1 Joseph L.

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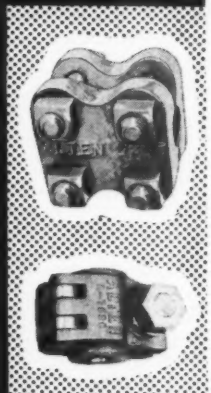

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Matthews, Precilla Graham Sur. 8, A-753, 5½ mi. SW of LaPryor, dry, TD 2,900 ft.

The Texas Co. B-1 Cross S. Ranch NCT-3, Block 33, Sec. 144, Cross S. Ranch Subd., Narcisco Aguirre Sur., A-3, 4 mi. E of Crystal City, dry, TD 4,610 ft.

Rocky Mountain

Weld County Colorado, Discovery Ready for Test

DENVER.—Shell Oil Co. is preparing to plug back and test its apparent Muddy sand discovery in the Buckingham area, Weld County, Colorado. The operator found water in the Dakota and Morrison zones and is now at 7,250 ft., total depth, with Dakota topped at 6,793 ft. and Morrison 7,185 ft. Muddy was found at 6,713 ft. and on drill-stem test in the sand the well flowed 38°-gravity oil. This will be the fourth commercial oil discovery in the current Julesburg basin wildcat campaign. It is reported that Shell has additional wildcat prospects through this basin and will continue its wildcat program on completion of the present well. The well is 1 Hanson, NE NE NE 33-8n-59w, 25 miles north of production in the Lee pool, Morgan County. Shell did seismic work in the area prior to drilling the well. Leasing has continued throughout this basin in recent weeks, with the play now extending northwest of previous leasing in the basin. Carter Oil Co., Amerada Petroleum Corp., Plains Exploration Co., Continental Oil Co. and others are reported having lease brokers in the area. During the past 3 weeks more than 200,000 acres of state lands through Morgan, Weld, Washington and eastern Adams counties were leased, and the play is still continuing.

Continental Oil Co. has completed two new wildcats in the Sussex-Meadow Creek area, Johnson County, Wyoming, for the sixth pool in the area. At 47 Unit, SE NW NW 18-42n-78w, new production has been established in the Sussex sand with the well completed for a potential of 225 bbl. of oil daily. This well is on the northwest side of the Sussex pool proper, an extension in a Lakota sand producing area. Well 5 Unit, NE NE SE 9-41n-78w, wildcat 1 mile west of production in the Meadow Creek Unit, flowed 384 bbl. of oil daily through choke. This well flowed from the Shannon sand, but made water in the Sussex and Frontier sands. At West Sussex, Mel Collier of Casper has suspended 1 Government, NW NE SE 4-42n-80w, with total depth at 4,714 ft., in Lakota. This well had shows of gas but recovered water in all prospective formations.

South of the Salt Creek, Teapot area, Natrona County, Wyoming, Amerada Petroleum Corp. is completing its best well in the pools of the Sage Spring Creek Unit. Well 9 Unit, NE NE SE 31-37n-77w, ½ mile southeast of the Sage Spring Creek discovery, flowed on 50-minute drill-stem test of the Dakota sand. Dakota was topped at 7,261 ft. and the test was between 7,267-91 ft. with tool open 55 minutes. Other producers in the area have had hard tight Dakota zones, but the porosity was reported much better in this well. Amerada has established production in three pools on this 30,500-acre unit.

WYOMING WILDCAT SUCCESS

Meadow Creek, Johnson County: Continental Oil Co. 5 Unit, NE NE SE 9-41n-78w, TD 7,617 ft., estimated flowing potential 384 bbl. oil per day, ¼-in. choke, from Lakota, 7-in. csg. at 7,540 ft., Sussex 3,760 ft., Shannon 4,286 ft., first Frontier 6,170 ft., second Frontier 6,554 ft., Lakota 7,543 ft.

COLORADO WILDCAT FAILURES

Massadona, Moffat County: Seaboard Oil Co. 2 Govt., C NE NW 12-3n-100w, TD

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Menlo Research Laboratory

P. O. BOX C522 MENLO PARK, CALIF.

3,425 ft., dry, Frontier 520 ft., Dakota 817 ft., Morrison 883 ft., Curtis 1,490 ft., Navajo 1,655 ft., Timpas 2,375 ft., Shinarump 2,610 ft., Moenkopi 2,678 ft., Weber 3,305 ft.

Hartzel, Park County: McDannald Oil Co. 1 fee, Tract 44, 28-11s-73w, TD 2,087 ft., dry in Franite. No tops reported.

Hudson area, Weld County: George Marshall 1 fee, CSL NE SE 34-2n-65w, TD 2,182 ft., dry, gas shows in Pierre, not commercial.

MONTANA WILDCAT FAILURES

Bannatyne field, Chouteau County: Tom Carney 2 Speer, SW SE SW 5-25n-1e, TD 1,480 ft., suspended indefinitely.

Womans Pocket Anticline, Golden Valley County: R. M. Amick et al 1 N.P.R.R., SE SE NE 29-8n-21e, TD 2,112 ft., suspended indefinitely.

UTAH WILDCAT FAILURE

Evanston area, Summit County: Utah Southern 1 Hatch, SW SE NW 28-6n-8e, TD 5,050 ft., suspended indefinitely.

NORTHERN NEW MEXICO WILDCAT SUCCESSES

Cedar Hill, San Juan County: Delhi Oil Corp. 1 Mudge, SE SW SE 21-31n-11w, TD 4,951 ft., flowed 415 M.c.f. gas daily, 5½-in. liner, Cliffhouse 4,050 ft., Point Lookout 4,760 ft.

South Mudge, San Juan County: J. D. Hancock 2 Mudge-Federal, NW SE NW 18-27n-11w, TD 1,845 ft., shot 160 qt. 1,795-1,845 ft., flowed 1,250 M.c.f. gas daily, 5½-in. casing at 1,760 ft., Pictured Cliffs 1,754 ft.

NEBRASKA WILDCAT FAILURES

West Huntsman, Cheyenne County: Nebraska Drillers, Inc., 1 Lohr, SE NE NE 7-14n-50w, TD 5,029 ft., dry, Pierre 1,030 ft., Niobrara 4,030 ft., Ft. Hayes 4,305 ft., Codell 4,390 ft., Greenhorn 4,535 ft., first sand 4,814 ft., second sand 4,860 ft., third sand 4,963 ft.

Wildcat area, Garden County: Kerr-McGee and Stanolind 1 E. Eldred, NW NW SW 10-19n-44w, TD 3,839 ft., dry, Pierre 1,074 ft., Niobrara 2,512 ft., Greenhorn 3,110 ft., Graneros 3,142 ft., Muddy 3,337 ft., Skull Creek 3,588 ft., Dakota 3,750 ft.

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Permian Basin

Strawn Production at Kelly-Snyder Extended

MIDLAND.—Sun Oil Co. completed its 1-A G. H. Arledge, SW SE 193-H&TC, as a Strawn well, extending pay from that section 1½ miles to the southwest, on the southwest flank of Kelly-Snyder field of Scurry County. The 1-A Arledge flowed 200 bbl. of oil, with no water, on 24-hour completion test, from perforations at 7,652-82 ft. Flowing tubing pressure was 575 psi., using ⅜-in. tubing choke. The pay section had been treated with 2,000 gal. of acid, then swabbed for 10 hours, at which time the well kicked off and flowed 52 bbl. of oil and 15 bbl. of wash water in 7 hours. Location is just north of the Schattel area, Section 186, where Sun drilled its Schattel discovery and three dry holes.

Five miles northwest of Diamond M field, near the western Scurry County line, Delta Gulf Drilling Co. and others 1 H. H. Eiland, SE SE 283-97-H&TC, showed gas in 1 hour and 35 minutes, oil in 2 hours and flowed 10 bbl. of fluid an hour for 24 hours cut 20 per cent with salt water, then 4 bbl. of fluid an hour for 10 hours with the same cut, on a drill-stem test at 8,179-86 ft., in the Ellenburger. Total depth was 8,230 ft., in dolomite, drilled out to 8,205 ft. Operators ran tubing for further tests. First drill-stem test, from 8,169-8,205 ft. had gas in 1 minute, oil in 1 hour, and flowed 10 bbl. of fluid an hour for 37 hours, being 73 per cent oil. Drill pipe also unloaded while coming out.

In southwestern Scurry County, about 3 miles southwest of Sharon Ridge field and 3½ miles southeast of Von Roeder field, W. C. McBride 1 Louis Conrad, SW SW 73-25-H&TC, was drilling in chert at 8,206 ft. The formation was not identified.

In East Polar field of southern Kent County, Kewanee Oil Co. 2-D Wilson Connell, NW NW 3-4-H&GN, ⅝ mile northwest of the 1-C Wilson, upper Pennsylvanian discovery, was indicating a deeper pay in the Pennsylvanian which was believed to be Strawn. On a drill-stem test from 7,192-7,208 ft., gas showed in 6 minutes and oil in 65 minutes. It was allowed to flow through ⅜-in. choke for 15 minutes, at an estimated rate of 35-45 bbl. of 40°-gravity oil an hour. Flowing pressure ranged from 900-1,375 psi. and shut-in pressure was 3,300 psi. in 15 minutes. Operators were coring ahead. Location from county lines is 4¾ miles north of the south line and 6 miles east of the west line.

The 2-D Wilson Connell topped the Pennsylvanian reef at 6,875 ft., or minus 4,654 ft., which was 24 ft. low structurally to the reef in the 1-C Connell. Kewanee announced plans to drill a west offset to the 1-C Conlell as the 2-C, and located 660 ft. from north and 1,980 ft. from west lines of the southwest quarter of Section 3.

Seaboard Oil Co. and Republic Natural Gas Co. staked location for a 7,500-ft. Pennsylvanian test 2½ miles north and slightly east of Salt Creek Canyon reef field. The test is to be the 1 Girard Trust Estate, located near SE SW 9-1-H&GN.

Four miles north of Polar field and just east of the west Kent County line, Star Oil Co. and others 1 Blanche Young, NW NW 54-5-H&GN, reported hard lime with no shows from 7,424-28 ft., then soft porous lime from 7,428-43 ft., with good stain, odor and fluorescence. A 1½-hour drill-stem test from 7,409-51 ft. recovered 165 ft. of fluid, being 135 ft. of heavily oil-cut mud and the remainder muddy salt water. Operators were drilling ahead.

A new deep wildcat for Terry County was staked by Nelson Bunker Hunt Estate as the 1 A. M. Brownfield, SE NW 74-T-

D&W. Contract depth was 10,500 ft. Location of the proposed test is 3 miles southeast of Brownfield, and about 2 miles north and slightly east of Union Oil Co. 1 Cotten.

Amerada Petroleum Corp. was assured of a third Wolfcamp producer in the new area west of Adair field, in south Terry County, as the 1 Miller, 6-C37-PSL, east offset to the discovery, had flowing production from the Wolfcamp. On a 4½-hour drill-stem test at 8,506-60 ft., gas showed in 19 minutes, mud in 1 hour and 25 minutes and oil in 1½ hours. In 3 hours the well made 56.19 bbl. of 43°-gravity oil. Amerada's 1 Willard was last reported drilling at 12,115 ft., and operators had filed an amended application to deepen to 13,000 ft.

West of the Mound Lake Pennsylvanian field, northeast Terry County, Houston Oil Co. 1 H. C. Hinson, 2-T-D&W, was drilling lime and shale at 10,188 ft. A drilling break was reported from 10,183-88 ft.

Sinclair Oil & Gas Co. has announced a 12,200-ft. exploration test in the new area of southern Terry County, ¼ mile north of Amerada 1 Willard. Sinclair's well is to be the 1 Golden, SE SW 7-C37-PSL. According to reports, if the 1 Golden develops production in the Pennsylvanian, as did the 1 Willard, drilling would be stopped there.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Sterling County: Plymouth Oil Co. 1 TXL, NW NW 1-31-T5S-T&P, 14 mi. W, 3 mi. S Sterling City, TD 2,435 ft., elev. 2,589 ft., Clear Fork 2,425 ft., IP pumped 20 bbl. 32°-grav. oil a day.

Tom Green County: V. J. Meyer 1 Geo. Foster Rust, NW NW 201-11-SPRR, 6 mi. E Susan Peak field, TD 4,565 ft., PB 3,982 ft., elev. 1,979 ft., IP pumped 10 bbl. 30°-grav. oil a day, upper Strawn perf. 3,065-82 ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Garza County: Ken-Tex Oil Corp. 1 Mrs. I. N. McCrary-Stanolind, SE SE SE 81-5-GH&H, 12 mi. E Post, dry, TD 3,069 ft.

Geo. P. Livermore, Inc., 1 Hattie Connell, 8-5-GH&H, dry, TD 3,310 ft., had sulfur water at TD.

Howard County: L. H. Armer 1 C. L. Jones, SE NW 34-26-H&TC, 5 mi. SW Dunn field, dry, TD 8,103 ft., elev. 2,290 ft., Canyon reef 7,640 ft.

Geo. P. Livermore and Texas Pacific Coal & Oil Co. 1 W. B. Currie, NW SE 29-31-T2N-T&P, 1½ mi. NE 1 Hardy, dry, TD 8,670 ft., elev. 2,625 ft., San Andres 2,765 ft., Spraberry 5,580 ft., Wolfcamp 6,595 ft., Dean sand 6,795 ft., reef 8,316 ft.

Lomax Bros. Drilling Co. and R. J. Zonne 1 L. M. Anderson, NW NE 11-31-T2N-T&P, 16 mi. NE Big Spring, dry, TD 7,708 ft., elev. 2,595 ft., Spraberry 5,455 ft., reef 7,600 ft.

Martin County: Ted Weiner 1 L. B. Epley, on 40-acre lease covering NE NE 43-36-T2N-T&P, 2 mi. SW Lenorah, dry, TD 8,005 ft., elev. 2,818 ft., San Andres 4,130 ft., Spraberry 7,460 ft.

Ted Weiner 1 W. T. Epley, SE SE 40-37-T2N, T&P, 4 mi. SW Lenorah, dry, TD 665 ft.

Ted Weiner 1 C. L. Russell, 1-37-T1N-T&P, 4 mi. SW Lenorah, dry, TD 660 ft. in shale.

Runnels County: L. D. Gullitt & Jay Kirkman 1 E. S. Malone, Tract 38, M. J. Parramore Sur. 26, dry, TD 2,517 ft.

M. J. Mitchell 1 Jerry Lowe, Sec. 82, G. Gregg Sur., midway between North Winters and Jim Adams fields, dry, TD 5,196 ft., Gunsight 3,025 ft., reef 3,170 ft., Ellenburger 5,176 ft.

Ray & Woolf 1 O. O. McWilliams, Sec. 324, G. Hall Sur., 3 mi. E Crews, dry, TD 4,000 ft.

Tom Green County: Geochemical Surveys, Inc., 1 R. C. Jones, 190-11-SPRR, 8½ mi. SW Wall, dry, TD 5,434 ft., elev. 2,072 ft., Home Creek 3,765 ft., Strawn 5,025 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Roberts County: Helmerich & Payne 1 Flowers, SE NE 79-C-G&M, 14 mi. NW Miami, dry, TD 10,342 ft., elev. 2,925 ft., TD in Mississippian.

SOUTHEAST NEW MEXICO

HOBBS.—Shell Oil Co. 3-A State, 2-21s-37e, Ellenburger producer on the north side of the Drinkard Permian area of southeastern Lea County, was testing in open hole from 7,760 ft., bottom of 5-in. casing, to 7,905 ft., total depth in the pre-Cambrian. In 15 hours, flowing through 16/64-in. choke, the well made 274 bbl. of 42°-gravity oil, with gas-oil ratio of 1,043 cu ft. Top on the Ellenburger was 7,725 ft., and the pre-Cambrian at 7,900 ft. The well had also shown for commercial production in the McKee section of the Simpson.

Two miles north of the Denton field, Ralph Lowe 1 Dickinson, 35-14s-37e, was drilling ahead following a 3-hour drill-stem test from 10,224-308 ft., which recovered 4,836 ft. of sulfur water, slightly cut with oil and gas.

Texas Gulf Coast

New Discovery Indicated Southwest of Cologne Field

HOUSTON.—A new discovery is indicated 1¼ miles southwest of Cologne field, Victoria County, at Morris Cannan 1 Pedro Pardo, P. Gallardo Survey, A-32. Although unconfirmed, it has been reported that the well flowed 120 bbl. of 36°-gravity oil daily through 6/64-in. choke, on 18-minute drill-stem test. Production was through perforations at 4,756-62 ft. Tubing pressure on the test was 600 psi.

Wood Petroleum Co. 1 Domesle, north outpost test to New Ulm field, Austin County, is attempting a dual completion. On a

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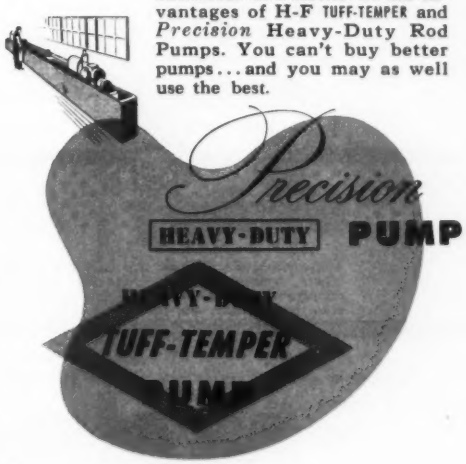

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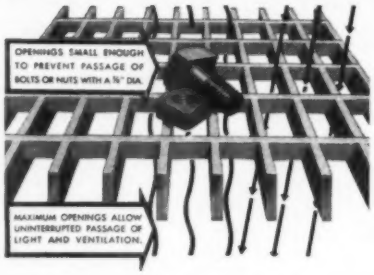
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test through perforations at 9,590-9,601 ft., the well is reported to have flowed between 200 and 300 bbl. of 52°-gravity distillate per day through ¼-in. choke. A dual completion packer was set and operator is now testing for production in the 9,800-ft. sand. The well was drilled to a total depth of 10,826 ft. Location is in the Thomas Hill Survey.

Humble Oil & Refining Co. has completed 1 Hugo McMillen for a new gas sand producer and extension well to Gottschalt field, Goliad County. On open flow gage, the well flowed 5,000,000 cu. ft. of gas per day through perforations at 7,483-98 ft. Test is ½ mile northwest of production in the field, being in the H. T. Callihan Survey.

In the South Hildebrandt Bayou area of Jefferson County, Sun Oil Co. 1 Aubey, wildcat, John J. French Survey, Abstract 23, has been completed as a gas-condensate producer. The well was drilled to a total depth of 8,600 ft. and operator perforated 8,370-78 ft. for completion attempt. Through a ⅛-in. choke, the well cleaned an ungaged amount of condensate and gas. Gravity of the condensate was 59.5° and tubing pressure was 2,700 psi.

United Producing Co., Inc., has run a drill-stem test from 7,756-71 ft. in 1 A. J. House, 8,000-ft. wildcat approximately 14 miles east-northeast of Arneckville field, DeWitt County. Using ¼-in. choke, recovery was 5 ft. of straw colored condensate and 5 ft. of mud with bottom-hole flowing pressure of 850 psi. Operators are now coring ahead below 7,776 ft.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Bee County: New pay at Blanconia—Bridwell Oil Co. 2 Fred Thomas, John Kelly Sur., A-35, TD 5,120 ft., perf. 4,950-59 ft., IP: 1,850,000 cu. ft. of gas per day, open flow, SIP 1,335 psi., GOR 176,000.

Brazoria County: New oil discovery—Amerada Petroleum Corp. C-1 State Lease 34,316, State Tract 8, Bastrop Bay, 13½ miles NE of Freeport, TD 8,485 ft., top pay 7,122 ft., perf. 7,122-36 ft., IP: 17 bbl. oil per day, 37.4° gravity, ¼-in. choke, TP 450 psi.

Jackson County: Gas-condensate discovery—Jake L. Hamon 1 Virginia Babb Wiley, Nestor Clay Sur., A-13, 4½ mi. SW of W. Ganado field, top pay 5,450 ft., TD 6,400 ft., perf. 5,450-52 ft., IP: 13 bbl. condensate per day, plus 5,500,000 cu. ft. of gas, TP 2,143 psi., CP 2,200 psi.

Liberty County: Gas-condensate discovery—William Hebert Hunt Trust Estate 1 E. W. Boyt, W. E. Fairchild Sur., A-656, N. Cottonwood area, TD 8,005 ft., perf. 7,884-92 ft., flowed gas and condensate through 14/64-in. choke, no gage., TP 2,200 psi., CP 800 psi.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Bee County: Dirks & Wood 1-A J. E. Martin Estate, B. B. Atkins Sur., A-265, 10 mi. NW of Beeville, dry, TD 2,401 ft.

Live Oak County: Buffalo Oil Co. 1 Sanger Estate, TTRR Sur., 349, A-521, 7 mi. SW of Clay West field, dry, TD 3,407 ft.

Matagorda County: Brazos Oil & Gas 1 T. H. Lewis, J. E. Pierce Sur., 2½ mi. NE of Collegeport, dry, TD 5,985 ft.

Orange County: Prince Drilling Co., et al 1 Powell Lumber Co., H. Vanway Sur., A-412, 10 mi. N of Orange, dry, TD 8,106 ft.

Victoria County: Rock Hill Oil Co. et al 1 F. J. Schiller et al, Mowry Irwin Sur., A-185, 4 mi. N-NW of Placedo field, dry, TD 6,810 ft.

Wharton County: S. W. Richardson et al 1 E. J. Steves, J . J. Dillard League, A-18, dry, TD 6,382 ft.

South Louisiana

Confirmation Wells for Glenmora Near Completion

NEW ORLEANS.—In the new Glenmora field, Rapides Parish, two confirmation tests to the discovery well have set pipe and are preparing to make production tests. The east offset, Texas Pacific Coal & Oil Co. 1 J. A. Bentley, 35-1s-2w, is at total depth of 10,805 ft., and operators are preparing to perforate. At Brown & Wheeler 1 W. F. Gill, 35-1s-2w, north offset, operators have cored below 10,856 ft., and are reported to have logged oil sand indicative of a producer.

Humble Oil & Refining Co. has applied for permit to drill a 10,500-ft. test 7½ miles northeast of Alcazar townsite, in Lake Pontchartrain, St. Charles Parish. Drillsite is 1 State Lease 1,317, 41-11s-9e, Lake Pontchartrain. The only oil production found in the lake is on the north side where Atlantic Refining Co., Temple Hargrove and Lynn Oil Co. opened a gas-condensate field near Bayou Lacombe.

In St. Bernard Parish, Richardson & Bass recovered fish in their closely watched wildcat, 1 Albert Ruiz, 136-14s-14e, To date, only salt water has been recovered in the well. Operators are currently attempting to squeeze perforations at 11,635-54 ft. Hole is bottomed at 13,003 ft.

Offshore, in Bay Marchand field, Lafourche Parish, The California Co. has closed-in gas well that flowed 3,560,000 cu. ft. of gas per day through a 7/16-in. choke. Completion was made through open hole at 2,100-15 ft., with a tubing pressure of 820 psi. Operators will plug off this section and work on up the hole, presumably to find oil production. The try had several hundred feet of saturated sand, but apparently tapped part of the gas cap of the huge dome.

The 20 new locations include 3 wildcat starts, one each in Acadia, Jefferson, and St. Charles parishes. There were no successful exploratory wells completed, however, one was reported dry in Beauregard Parish.

SOUTH LOUISIANA WILDCAT FAILURE

Beauregard Parish: Sun Oil Co. 1 Trittico, 28-5s-9w, dry, TD 9,002 ft.

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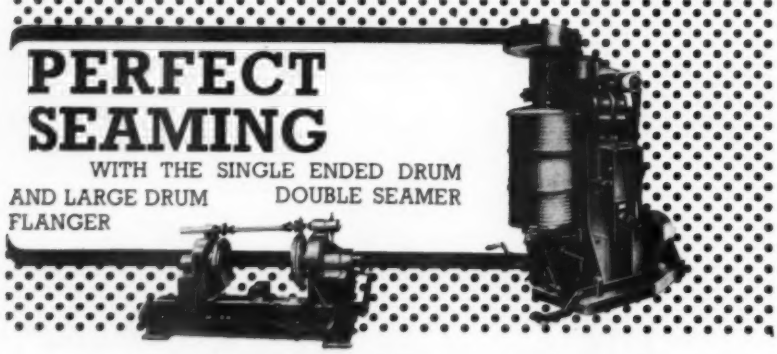

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North Central Texas

Knox County Caddo Sand Discovery Completed

WICHITA FALLS.—Sinclair Oil & Gas Co. has completed its 1 G. H. Beavers, Section 224-44-H&TC, as a new Caddo sand discovery in Knox County. After drilling to 6,400 ft., the well was plugged back to 5,935 ft. and perforated with 96 shots from 5,920-35 ft., where it pumped 84 bbl. of 38°-gravity oil a day on potential test. Electrical surveys indicated the Caddo lime from 5,746-67 ft., carrying salt water, and the sand from 5,914-38 ft. Location is 3 miles north of Benjamin, and about the same distance southeast of Truscott field.

Other Knox County activity included a location by Martin Properties, Wichita Falls, for 1 R. L. Ratliff in the Robert Wilkins Survey, A-441, 2½ miles southwest of Goree, which is about 1,400 ft. southeast of Fowler Farm Oil Corp. 1 Ratliff, sand discovery. The latter well was estimated good for 40-50 bbl. of oil a day and was ready for completion at 1,675-91 ft.

Texas Pacific Coal & Oil Co. completed its 2 Louis Cartwright "A," S. Washburn Survey 215, A-410, in the new Cartwright-Strawn field 4 miles southeast of Munday in southeast Knox County. On potential the well pumped 64 bbl. of oil a day from pay at 4,538-41 ft.

Sinclair's 1 John Jones, wildcat in Subdivision 11, D. G. Burnett Survey 7, A-15, 5 miles northeast of Knox City, was drilling ahead at 3,932 ft. in sand and shale.

An-Son Petroleum Corp. 1 S. A. Allison, prospective conglomerate discovery 4½ miles southwest of Stoneburg, Montague County, reported limestone with oil odor from 6,072-6,100 ft. Operators drilled to 6,108 ft., then drill-stem tested from 6,074-6,108 ft. for 1 hour. Gas surfaced in 3 minutes and the well sprayed oil in 57 minutes. Recovery was 400 ft. of clean oil plus 2,400 ft. of heavily oil-cut mud. Bottom-hole pressure was 2,250 psi. in 20 minutes and flowing pressure on the test was 750 psi. Location is in the W. H. Dorsey Survey. It was to drill ahead.

Six miles south of Montague, Mid-Continent Petroleum Corp. stopped drilling at its 1-A Herbert, E. Wingate Survey, following a 2-hour drill-stem test at 6,475-91 ft. Gas came to the surface in 24 minutes and recovery was 360 ft. of oil-cut mud, plus some 3,000 ft. of salt water.

In the new Boedecker field, 4 miles northwest of Bowie, The Texas Co. 1 E. S. Avery, Section 2,833, TE&L Survey, recovered 145 ft. of oil-cut mud, and some free oil, on a 2-hour drill-stem test from 6,792-6,800 ft. Bottom-hole pressure in 20 minutes was 900 psi. Casing was being run at last report.

In Jack County, 6 miles northeast of Jacksboro, Robert S. Lytle 1 J. C. Riggs, prospective discovery in the William F. Buckner Survey, A-1045, was perforated with 84 jet shots from 5,382-96 ft., in the conglomerate, and after being shut in 4 hours kicked off and flowed into pits making a spray of oil, gas and water. The flow was through 48/64-in. choke, under tubing pressure of 1,200 psi. The well was still flowing to clean at last report.

J. Simmons 1 J. C. Carpenter, semiwildcat 8½ miles northwest of Jacksboro, R. Carson Survey, A-167, recovered 117 ft. of black oil and 3 ft. of salt water on a 1-hour drill-stem test of sand from 2,603-07 ft. It was to drill ahead.

NORTH TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Coleman County: Ren-Gro Oil Co. and Roswell Oil Co. 1 W. B. Griffin, Blk. 12, Mahoney addition, Santa Anna townsite, W. Doran Sur. 666, 150 ft. out of NE corner of blk., TD 1,824 ft., pay 1,806 ft., IP flowed 102.9 bbl. of 43.7°-gravity oil a day, 12/64-in. choke, GOR 285 cu. ft., CP 320 psi., TP 85 psi.

Taylor County: Hiawatha Oil & Gas Co. 1 Frank Antilley, 176-64-H&TC, 3 mi. SW Shep, TD 5,385 ft., PB 5,295 ft., elev. 2,124 ft., perforated 5,204-15 ft., IP pumped 46 bbl. 43°-gravity oil a day, GOR 1,000 cu. ft.

Throckmorton County: Shamrock Oil & Gas Corp. 1 C. R. Perry, Sec. 2,165, TE&L Sur., 4 mi. SW Elbert, TD 4,820 ft., elev. 1,320 ft., Mississippian pay 4,810-20 ft., IP pumped 59 bbl. 40°-gravity oil a day, GOR 455 cu. ft.

Wise County: Greenbrier Oil Co. 1 B. P. Vaught, S. G. Evitts Sur., A-266, 1½ mi. NE Boonsville, TD 5,970 ft., PB 5,885 ft., elev. 981 ft., Caddo 4,165 ft., perforated conglomerate 5,073-79 ft., IP flowed 32.95 bbl. 48°-gravity oil a day, ¼-in. choke, TP 670 psi.

NORTH TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: Davis & Davis 1 D. L. Wolf, SPRR Sur. 1,415, 15 mi. SW Archer City, dry, TD 1,363 ft., sand with oil odor 1,115 ft.

C. E. Morrison 1-H Luke W. McCrory, Lot 1, Blk. 122, ATNCL Sur., 3 mi. NE Archer City, dry, TD 4,735 ft.

Neeld & Hood Drilling Co. 1 L. Kinder "A," Lot 62, Clark & Plumb, Blk. 5, 5 mi. NE Archer City, dry, TD 3,833 ft.

Harry F. Snebold 1 J. S. Schriever, Lot 113, Blk. 4, Clark & Plumb, 5 mi. SW Scotland, dry, TD 3,854 ft.

Timberlake & Kelleher 1 J. H. Turbeville, Blk. 181, Hackett Sur., A-175, 5 mi. NW Archer City, dry, TD 1,960 ft.

Baylor County: J. J. Lynn 1 Lucy Jones, Sec. 210, T&NO Sur., 8 mi. E Seymour, dry, TD 5,261 ft., Canyon lime 5,216 ft.

Brown County: Carrican & Arledge 1 Woodley, E. R. Myers Sur. 201, ½ mi. SW Brooksmith, dry, TD 520 ft.

C. A. Young 1 J. C. Grubbs, Samuel Banks Sur., ½ mi. SW Bangs, dry, TD 1,405 ft.

Clay County: McMahon, Bullington Drill-

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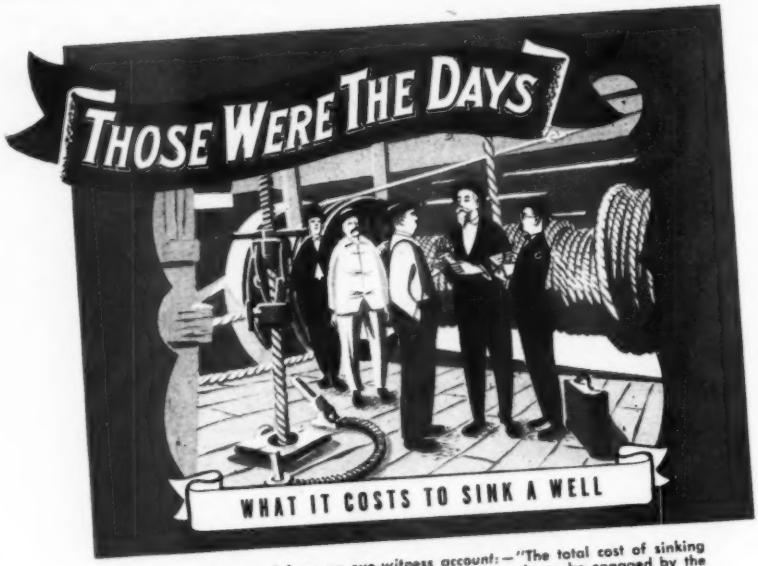

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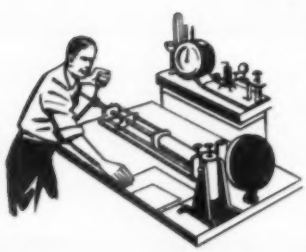

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ing Co. 1 S. Y. Ferguson, Blk. 35, Byers Bros. Subd., 1½ mi. W Petrolia, dry, TD 2,009 ft.

Coleman County: Geo. T. Lackey 1 F. H. Stanton, James D. Knox Sur. 367, 4 mi. SE Rockwood, dry, TD 1,205 ft.

Comanche County: T. W. Murray and J. W. J. White 1 W. S. Lawrence, HT&B Sur., Sec. 4, 5 mi. SW Comanche, dry, TD 2,980 ft., elev. 1,800 ft.; Marble Falls 2,677 ft., Ellenburger 2,910 ft.

Cooke County: Wayne Freeman, Jr. 1 L. M. Atchison, W. D. Easley Sur., A-1,481, 4 mi. W Hood, dry, TD 1,662 ft.

W. Freeman and R. B. Hollandsworth 1 S. B. Hopkins, G. Lockhart Sur., A-606, 4 mi. W Hood, dry, TD 1,646 ft., sand with odor 1,568-69 ft.

Eastland County: McElroy Ranch Co. 1 Lela Latch, 16-2-BBB&C, 2 mi. W Cisco, dry, TD 4,205 ft., elev. 1,703 ft., Caddo 3,177 ft., conglomerate 3,582 ft., Ellenburger 4,131 ft.

Fisher County: Woodley Petroleum Co. and Ring Engineering Co., Inc. 1 H. F. Grindstaff, John Chumley Sur. 312, 3 mi. SE Rotan, dry, TD 6,531 ft., elev. 1,949 ft., base Sedwick 3,240 ft., Noodle Creek 3,448 ft., Chester 6,392 ft., Chappel 6,441 ft., Ellenburger 6,496 ft.

Jack County: J. E. Costello 1 Mrs. S. N. Roberts, Martha E. Small Sur., A-1427, 5 mi. SE Antelope, dry, TD 500 ft.

Jones County: C. E. Kadane & Sons 1 Hicks, Sec. 5, Orphan Asylum Lands, 4½ mi. S Avoca, dry, TD 3,275 ft., elev. 1,498 ft., sand 1,880 ft., reef 2,764 ft.

Nolan County: Sun Oil Co. 3 B. K. Stone, NE SW 76-X-T&P, 11½ mi. SW Sweetwater, 4,176 ft. NE 2 Stone, dry, TD 6,354 ft., elev. 2,532 ft., Noodle Creek 4,020 ft., reef lime 5,950 ft.

Montague County: Jones, McFarland & O'Connell et al 1 E. A. Fincher, Sec. 12, MEP&P Sur., A-522, 4 mi. SE Nocona, dry, TD 6,180 ft., elev. 975 ft., conglomerate 5,904 ft.

Konrad Sztykgold 1 Minnie Littell, G. E. Givens Sur., A-310, 3 mi. E Mallard, dry, TD 6,994 ft., elev. 1,173 ft., conglomerate with odor 6,888-96 ft.

Throckmorton County: Cooper Hemphill Oil Co. 1 M. A. Tuttle, F. M. Fonnell Sur., A-1285, 5 mi. NE Woodson, dry, TD 2,000 ft. in shale.

Wichita County: B. M. Hester & Son 1 John Nitschke, East Blk. 1, M. Ramsey Sur., A-471, 6 mi. SW Wichita Falls, dry, TD 4,708 ft., Vogtsberger sand 4,686-96 ft.

Young County: J. J. Lynn 1-D C. M. Benson, Sec. 1,482, TE&L Sur., A-1221, 6 mi. E Olney, dry, TD 1,094 ft.

J. J. Lynn 1 S. M. Benson "E," Sec. 1,482, TE&L Sur., 6 mi. E Olney, dry, TD 917 ft., oil show 912-917 ft.

Timberlake & Kelleher 1 W. B. Howard, TE&L Sur., 3,401, 3½ mi. NW Farmer, dry, TD 900 ft.

Michigan

Antrim County Wildcat Finds Gas in Traverse

MOUNT PLEASANT. — A Traverse pay which gaged at rate of 2,180,000 cu. ft. of gas daily in 8 minutes on drill-stem test was logged at Ohio Oil Co. 1 State-Custer, NW SW NW 16-29n-7w, Custer Township wildcat, Antrim County. Top of Traverse lime was logged at 1,069 ft. and gas showed on drill-stem test from the section cored at 1,070-99 ft. Best porosity in this core was reported from 1,070-78 ft. The balance of this first core, and a second which was cut from 1,099-1,115 ft. was described as being of lime and dolomite with shale. A drill-stem test was run to test the part of the Traverse covered by the second core and hole flowed mud and water. Well was drilling below 1,500 ft. at last report. Plans call for a core program and test of both the Dundee and Richfield zones before final

completion. The Richfield is expected at about 3,350 ft.

This Antrim County wildcat is owned jointly by Ohio Oil Co. and Sohio Petroleum Co. Ohio is the operator. The block being tested and which will be operated jointly coveres about 6,000 acres. This deeper objective test, which shows promise of being one of the most significant northern Michigan wildcats to be drilled in 1950, follows a comprehensive core-drill program in the area which dates back to 1947. After the first core drilling was completed, and at a later time, a follow-up and more detailed coring program was done in the area by Ohio and Sohio.

Cities Service Oil Co. failed to log commercial oil or gas pays in any of the horizones drilled at its 1 O'Hara, SE SW SW 17-14n-4w, Union Township, Isabella County, the north 20-acre offset to Rand & Collin's 1 Albar, Traverse oil discovery. The Cities Service test was bottomed dry at 3,884 ft. after the Traverse, Dundee and Reed City zones were penetrated. Traverse was at 3,114 ft. and Dundee was logged at 3,731 ft.

MICHIGAN SUCCESSFUL WILDCAT

Kalkaska County, Excelsior Township: Neil Wagenaar and Edward Wagner 1 Boy Scouts of America & Marshall, SE SW SE 11-27n-6w, Traverse 2,004 ft., 10 bbl. TD 2,042 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: Joe E. Kaplan 1 Daybreak Farm, NE SE SW 6-1n-16w, Traverse 1,444 ft., dry, TD 1,147 ft.

Lee Township: Ward Oil Co. 1 Hildebrand, NW NW SE 23-1n-15w, Traverse 1,197 ft., dry, TD 1,205 ft.

Arenac County, Lincoln Township: John L. McEvoy 1 Bradley Heirs, SW SW SE 31-18n-4e, Dundee 2,814 ft., dry, TD 2,985 ft.

Eastern Texas

Possible Extension to Forest Hill Recovers Oil

DALLAS. — A new sub-Clarksville sand discovery, or extension, was in prospect at Edson Petroleum Co. 1 J. L. Jacobs, W. H. Secrest Survey, 7 miles southwest of Winnsboro in Wood County. A 30-minute drill-stem test from 4,538-50 ft. recovered 1,140 ft. of 17.8°-gravity oil. Total depth was in the Woodbine, which apparently had no shows. Location is about 4 miles northeast of Forest Hill sub-Clarksville field.

McAlester Fuel Co. has staked location and was moving in materials for its 1-A Harry Golden Estate, Travis Peak wildcat 2 miles north of Douglasville in northern Cass County. Location is 660 ft. from west and 489 ft. from south lines of a 45½-acre tract in the William F. Weatherly Survey. Contract depth was 6,500 ft.

T. D. Humphrey staked location for his 3 N. E. Tharp, 4 miles southeast of Kemp in southern Kaufman County. The new test is 1,385 ft. from south line and 330 ft. from the east line of D. Cervantes Survey, and is 1,000 ft. north of the same operator's 2 Tharp, Bacon limestone discovery well. Projected depth of the new test was around 6,500 ft.

A. O. Phillips and others have drilling under way on a 5,500-ft. wildcat 2 miles southwest of Quitman and about half way between the Quitman and Merigale Paul fields of Wood County. The new prospector is 1 H. S. Cathey, located 660 ft. from north and 330 ft. from east lines of the J. E. Allen Survey, A-17. Stanolind Oil & Gas Co. was reported supporting the test.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURES

Denton County: J. W. Hickey & Sons 1 E. R. Waide, Stephen Westbrook Sur., A-1336, 3½ mi. N Bolivar, dry, TD 1,943 ft., elev. 656 ft., limestone with oil show 1,580-1,620 ft.

Taubert Drilling Co. 2 E. M. Rucker, A-617, H. Harmon Sur., 4 mi. NW Krum, 660 ft. S 1 Rucker, dry, TD 1,800 ft.

Henderson County: Byars, Bond & Andrade 1 H. W. Tompkins, J. McGregor Sur., 3 mi. S Edom, dry, TD 5,230 ft.

McLennan County: C. P. Quinlan 1 R. R. Prause, University Lands Sur., 2 mi. W West, dry, TD 970 ft., Kiamici 675-85 ft., Goodland 695-705 ft., Paluxy 835-45 ft., Glen Rose 855-65 ft., by samples.

Morris County: Andrew V. Erwin and Vernon Whiteley Drilling Co. 1 G. W. Apperson, J. R. Slaughter Sur. A-276, ½ mi. N Omaha, dry, TD 5,470 ft., Goodland 4,6165 ft.

Ohio Fields

Clinton Well Initials 155 Bbl. After Shot

COLUMBUS.—Waverly Oil Co. 1 Estella Ochse, Lot 23, Hopewell Township, Licking County, found the Clinton at 3,007-39 ft., and made 35 bbl. natural and 155 bbl. in 24 hours after a 120-qt. shot. The producer is ¼ mile northeast of the big Cooperider well in Bowling Green Township.

Two fair wells were brought in in Jackson Township, Knox County. Allen Willey 6 Meltzer, Section 22, logged the Clinton at 3,018-88 ft. with 8 bbl. natural and 25 bbl. in 18 hours after shot. The Blue Creek Gas Co. 5 Bailey, Section 10, with the sand

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THE OIL AND GAS JOURNAL

"I hope it don't slip—he owes me four bits!"

at 3,110-78 ft. showed 8 bbl. natural and 34 bbl. in 24 hours after shot.

Preston Oil 3 John Beiter, Section 27, Hopewell Township, Perry County, with the Clinton at 2,936-76 ft., made 21 bbl. natural then flowed 50 bbl. and swabbed 80 bbl. in 24 hours after an 80-qt. shot. The well extends Baker pool a location to the north. In Harrison Township, Foraker Drilling Co. 1 Morrison-Lewis, Section 33, flowed and swabbed 56 bbl. in 24 hours after shot. Clinton sand, 3,733-78 ft., had a good showing of both gas and oil natural.

OHIO SUCCESSFUL WILDCAT

Hocking County, Falls Township: Fickel & Goss Co. 1 E. M. Brown, Sec. 1, Clinton 2,640-67 ft., 28 bbl., TD 2,670 ft.

OHIO WILDCAT FAILURE

Summit County, Macedonia Township: Frank Lyons et al. 1 L. C. Miller, Lot 2, Clinton 3,707-96 ft., TD 3,883 ft.

Oklahoma

Cleveland County Gets New Wilcox Sand Pool

CLEVELAND County has a new Wilcox sand pool, located 15 miles northeast of Norman, where V. A. Brill and associates are completing their 1 Riordan, SE SE NE 16-8n-1e. After cleaning through 14/66-in. choke, showing considerable oil, the well has been turned into the tank. As this is written, flow had not been gaged.

Total depth is 6,427 ft. with top of the second Wilcox sand at 6,415 ft. and 5½-in. oil string at 6,417 ft. In a drill-stem test of this zone the well flowed at an estimated rate of 100 bbl. of clean oil per hour, and continued to flow for an hour and 55 minutes after the tester was closed. More than 1,770 ft. of oil was recovered in the pipe break-down. Gravity of the oil is 36.6° A.P.I.

Location of the well is in the eastern part of the county, 3 miles southeast of the Southeast Denver pool, nearest production. The latter pool produces from the Bartlesville sand. Roulette Creek is the name applied to the new pool.

Discovery of another new pool is indicated in Love County, southern Oklahoma, where Walter Gant and E. Dunlap, Jr., found good saturation and showings in Deese sand in their 1 Reid, SW SW SW 2-7s-2e. Hole, however, is being drilled ahead in exploration of lower potentially productive horizons. The location is about 3 miles southeast of the Greenville pool, opened earlier this year by Sohio Petroleum Co., and about 2 miles south and a little east of two oil producers in the shallow North Marietta pool.

Two drill-stem tests were made. In the first, taking in an interval at 6,020-35 ft., gas was at the surface within 29 minutes and flowed at an estimated rate of 200,000 cu. ft. per day. Final recovery was 440 ft. of 38°-gravity oil and 100 ft. of oil and gas-cut mud. Tool was open 3½ hours. Test was with a ⅝-in. bottom-hole choke. Shut-in pressure built up to 570 psi. in 15 minutes. The second test was made with hole deepened to 6,054 ft. and took in the entire zone. This test showed the same gas flow and oil recovery plus an additional 220 ft. of oil and gas-cut mud. Shut-in bottom-hole pressure built up to 2,050 ft. within 15 minutes.

Opening of a new pool or a major extension for the rapidly developing, recently opened East Sparks pool, southeastern Lincoln County, is in the making where Delaney Drilling Co. 1 Little, NE NE SE 17-13n-5e, encountered good saturation in the Prue sand and has run casing to test. The well, located a mile south of production, had 140 ft. of free oil and 85 ft. of oil-cut mud in the pipe following a drill-stem test at 3,536-53 ft. in the sand, topped at 3,535 ft. Productive horizon of the East Sparks pool is from the same sand at approximately the same depth.

In the southern part of the county, 10 miles due south of the Delaney well, and 3 miles north and a little east of the Northeast Shawnee pool of northern Pottawatomie County, Anderson-Prichard Oil Corp. has discovered what appears to be another Wilcox sand pool. Its 1 Bartodej, NW SW SE 32-12n-5e, in a 60-minute drill-stem test at 5,030-53 ft. in the second Wilcox sand, topped at 5,028 ft., recovered 280 ft. of heavily oil and gas-cut mud and 20 ft. of gas-cut mud. Casing has been run to 5,030 ft. for completion. First Wilcox sand, topped at 4,961 ft., also had good porosity and carried stainings and odors.

OKLAHOMA SUCCESSFUL WILDCATS

Pottawatomie County: Newt Barrett and G. Musgrave 1 Arch Butts, NE SE NE 8-6n-4e, IP 19 bbl. of 37°-gravity oil daily, Earlsboro, 3,736-41 ft., TD 4,710 ft.

Stephens County: W. H. Atkinson 1 George Butts, NE SE SE 32-2s-6w, IP 27 bbl. of 23°-gravity oil, limestone, 2,287-313 ft., TD 2,324 ft.

OKLAHOMA WILDCAT FAILURES

Canadian County: Exploration Oil & Gas Co. 1 E. M. Hadlock, C SW NE 30-13n-9w, dry, TD 11,711 ft.

Comanche County: J. C. Owens 1 E. J. Schram, C SW SE 4-1n-10w, dry, TD 414 ft.

Harbour et al 1 School Land, NW NW SW 36-1n-10w, dry, TD 2,624 ft.

Kiowa County: R. A. Mercer and Leon Huffines et al 1 Marie Kutz, SE SW NW 21-6n-17w, dry, TD 1,621 ft.

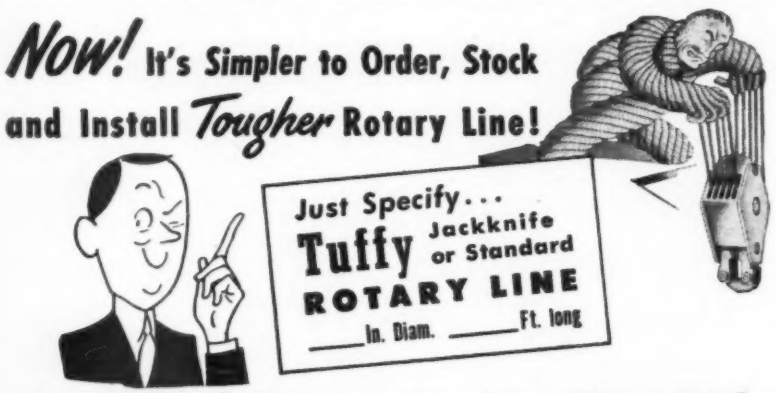
Harper & Turner 1 Zimmerman, NW NW NE 4-5n-16w, dry, TD 977 ft.

Lincoln County: Halco, Wagner, Thompson, and Hoffman 1 School Land, SE SE SW 16-13n-3e, dry, TD 5,041 ft.

Deep Rock Oil Corp. 1 A. Smith, NW NW NW 29-17n-4e, dry, TD 3,966 ft.

Love County: Texas Pacific and Continental 1 E. V. Forbes, NE NE NW 23-6s-1e, dry, TD 5,476 ft.

Pontotoc County: W. O. Smith et al 1 Star-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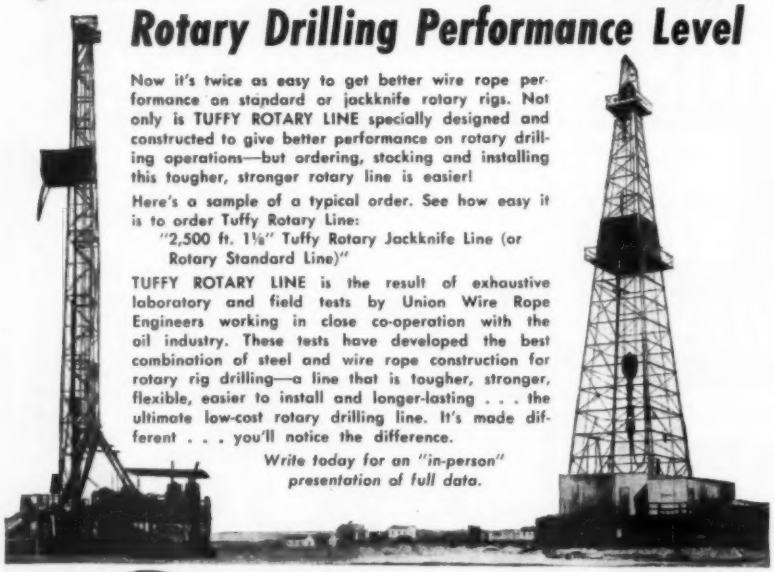

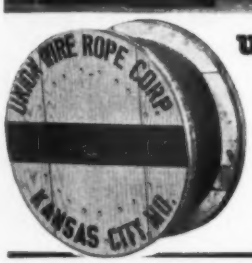

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Seminole County: Harley Turpin and T. C. Green et al 1 Walter Johnson, SE SW SW 21-8n-8e, dry, TD 1,405 ft.

Stephens County: R. B. Ross 1 Massey, SW EW NE 3-3s-7w, dry, TD 1,716 ft.

Canadian Fields

Big Valley D2 Discovery Finds D3 Productive

CALGARY.—Canadian Gulf Oil Co. found D3 Devonian oil at its Big Valley wildcat that had discovered oil in D2 zone earlier this month. The 7 Big Valley well, in LSD 7, 10-35-20w4, about 80 miles northeast of Calgary and 17½ miles south of Stettler D2-D3 Devonian oil field, is now being prepared for production tests.

The D3 reef at the Big Valley well was entered at 5,325 ft., and there was 11 ft. of oil pay found above the water line. Indicated potential during drill-stem tests in that horizon was around 900 bbl. daily. The D2 pay was topped at 5,240 ft., and around 39 ft. of oil pay was found in that horizon. Indicated potential from that zone was in excess of 1,000 bbl. daily. The well completed drilling in D3 at 5,435 ft. The crew was preparing to run 5-in. liner to bottom at last report.

A second natural-gas discovery has been made in the Cessford area of South-Central Alberta, about 95 miles east of Calgary. The well, Canadian Delhi 1 Cessford, in LSD 3, 16-24-13w4, made its discovery in the Lower Cretaceous formation. A 68-minute drill-stem test of interval 2,914-26 ft. gave a gas flow with maximum rate 2,564,000 cu. ft. daily. There was no fluid recovery in drill pipe.

The new strike is from a Cretaceous member somewhat higher in the formation than the discovery at Canadian Delhi 1 Cessford, 9¼ miles north-northwest of 2 Cessford, in LSD 2, 32-25-13w4. The 1 Cessford got gas in basal Cretaceous sands from 3,393-3,418 ft. Rated potential from part of the pay after casing and perforating was 3,500,000 cu. ft. daily. Base of the zone, on drill-stem tests, also showed a light spray of condensate. The 1 Cessford is now capped, pending securing of a market for gas.

Socony-Vacuum Exploration Co. has opened up and run potential tests on D3 zone at its Socony 1 Flint discovery well 12 miles southwest of Camrose, with potential of 35.5°-gravity crude oil in excess of 1,100 bbl. per day. The D2 zone, also productive, has not been opened. It is planned to perforate that horizon and test within the next few days. The discovery is in LSD 13, 17-45-21w4, about 40 miles southeast of Leduc-Woodbend field, and about the same distance north of Stettler field. The D3 zone interval 4,806-20½ ft., previously cased through, was opened with 108 jet-perforator shots, followed by 500 gal. of acid. An 8-hour test through ¼-in. choke gave oil at flow rate of 345 bbl. daily. A 4-hour test was made using ½-in. choke, and flow rate was 1,100 bbl. daily.

CANADIAN UNSUCCESSFUL WILDCATS

Pacific Western 1 Oyen, LSD 1, 4-30-5w4, TD 3,020 ft.

Texaco Superior 3 Ranfurly, LSD 11, 12-50-13w4, TD 2,250 ft.

Pacific 1 St. Germain, LSD 5, 21-86-22w5, TD 6,589 ft.

EASTERN CANADA

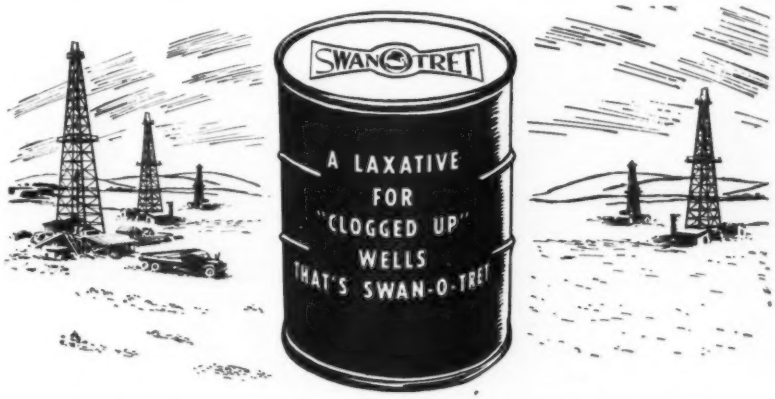
ONTARIO.—Imperial Oil, Ltd., drilling on the Brock Wellington farm in the north end of Moore Township, Lambton County, has finished a gasser in the Guelph-Niagara formation with initial flow of 7,000,000 cu. ft. Location is 2½ miles north of the Payne well, a 40,000,000 cu. ft. gasser drilled by Imperial last year.

Saskatchewan.—J. H. Brocklebank, resources minister for Saskatchewan, states that good indications of oil-bearing formations have been encountered in early drilling in the east-central part of Saskatchewan. Near the Manitoba boundary, due east of Prince Albert, two companies have drilled joint test holes at Ceba, 18 miles northeast of Hudson Bay Junction, and are working at Ruby Lake, 5 miles north. Another crew is drilling near Mistatim, 40 miles west of Hudson Bay Junction. Drilling is also in progress in the Gronlid district, 25 miles north of Melfort; in the Richard district, east of North Battleford; in the Kerrobert district, 64 miles southwest; and in the St. Walburg region, 50 miles southwest of Meadow Lake. Some porosity has been encountered, but details are not being made public pending completion of the tests.

Appalachian Field

Two West Virginia Wildcats Produce Gas

PITTSBURGH.—In Portland district, Preston County, West Virginia, Hope Natural Gas Co. 9414 Charles V. Ringer, wildcat, elevation 2,194 ft., gaged 375,000 cu. ft. of gas after shooting all pays. Corniferous lime 5,466 ft., chert 5,487-5,632 ft., gas 5,523, 5,580, 5,588 ft., Oriskany sand 5,632-75 ft., gas 5,642 ft., chert 5,675-5,836 ft., Oriskany sand 5,884 ft., gas 5,885 ft., total depth 5,984 ft. William E. Snee 3 Cora E. Lewis, elevation 2,089 ft., Corniferous lime 5,076 ft., topped the chert at 5,098 ft., with gas at 5,133-36 ft. and 5,166-68 ft. testing 50,000 cu.



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ft., and is drilling at 5,307 ft. Dry Fork district, Tucker County, Cumberland & Allegheny Gas Co. 1-A-425 Jason Harman, elevation 3,304 ft., is running 5½-in. casing to reacidize. Steele district, Wood County, Davis-Kelly Oil & Gas Co. 1 Charles D. and Audrey Post, elevation 848 ft., has been located. It is on the Belleville quadrangle 5.05 miles south of Lat. 39°, 10′ and 2.05 miles west of Long. 81°, 30′. Godfrey L. Cabot, Inc., completed 1,1329 O. E. Crow, wildcat, elevation 855 ft., gaging 622,000 cu. ft. of gas, after shot. Rock pressure 1,080 psi. in 52 hours. Corniferous lime 4,888 ft., Oriskany sand 5,017 ft., gas 5,018 ft., total depth 5,042 ft. Ralph Tudesco completed a good shallow-sand gas well in McKim district, Pleasants County, 2 R. J. Cunningham Heirs, resulting in 1,100,000 cu. ft. in the Maxton sand, total 2,100 ft.

In Unity Township, Westmoreland County, Pennsylvania, Peoples Natural Gas Co. 1-3921 Fred Musnug, elevation 2,100 ft., is drilling at 5,804 ft. In Napier Township, Bedford County, South Penn et al-Snee & Eberly 1 Jesse B. Miller, elevation 1,666 ft., is cleaning out at 7,640 ft. after completing fishing job.

WEST VIRGINIA SUCCESSFUL WILDCATE

Preston County, Portland district: Hope Natural Gas Co. 9414 Chas. V. Ringer, elev. 2,194 ft., 375,000 cu. ft. of gas, after shooting all pays, Corniferous lime 5,466 ft., chert 5,487-5,632 ft., gas 5,523, 5,580, 5,588 ft., Oriskany sand 5,632-75 ft., gas 5,642 ft., chert 5,675-5,836 ft., Oriskany sand 5,884 ft., gas 5,885 ft., TD 5,984 ft.

Wood County, Steele district: Godfrey L. Cabot, Inc., 1-1329 O. E. Crow, elevation 855 ft., 622,000 cu. ft. of gas, after shot, Corniferous lime 4,888 ft., Oriskany sand 5,017 ft., gas 5,018 ft., TD 5,042 ft., rock pressure 1,080 psi. in 52 hr.

Mississippi

Deep Holes in Area Going Deeper

JACKSON.—In Amite County, Mississippi, Humble Oil & Refining Co. is reported to be reaming down at approximately 10,400 ft. in its wildcat, 1 W. A. Stockard et al, SE SW 33-1n-6e, prior to setting protection string of casing. The test, which is being drilled tight, is bottomed at 11,660 ft. It is not known if protective string will be run to bottom or only a part of the way. It was reported that shows from an undetermined zone were coming through the drilling mud. However, electric log failed to indicate a productive sand, and it is presumed that it was either static gas or shows were coming from the bottom of the hole where electrical survey failed to reach.

At George Vasen 1 Tung Oil Corp., SW NE 9-2s-11w, Stone County wildcat, is at a depth of 18,358 ft. Operator continues to core in the well.

In Kingston field, Adams County, Stanolind Oil & Gas Co. 1 G. W. Armstrong, 11-5n-2w, west offset to the field discovery well, ran 5½-in. casing to 6,695 ft. Operators perforated at 6,643-46 ft. in the Wilcox, and ran a drill-stem test. On 4½-hour swab test, recovery was 36 bbl. of salt water and ¾ bbl. of oil. These perforations were squeezed and operators reperforated at 6,583-85 ft. Swabbing recovered 90 bbl. of salt water and 1 bbl. of oil in 5½ hours. These perforations were squeezed and at last report, operators were preparing to perforate 6,487-90 ft. in the Baker sand, which is the highest of three sands logged in the well.

On the Hatchetigbee anticline, Clarke County, Alabama, Danciger Oil & Refining Co. 1 John F. York, NE SE 1-7n-1w, has been cored continuously from 12,319-12,469 ft. after adding 30 tons of salt to the drilling mud. Recovery from cores was interbedded shale, anhydrite, and salt. Hole is bottomed at 12,517 ft. Because of the salt content of the mud, electric log could not be run, so gamma ray log was run, but maximum depth reached was 12,480 ft. Danciger, California Co., C. H. Murphy and

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D.C. Notice is hereby given that the NE¼NE¼ sec. 15, T. 9 N., R. 8 W., St. Stephens Meridian, 40 acres, within the known geologic structure of the Yellow Creek field, (undefined), Mississippi, will be offered for oil and gas leasing through competitive bidding, at 1 p. m., Eastern Standard Time, October 11, 1950, when bids will be opened. Details of the lease offering, how and where to file bids and a description of the lands may be obtained by addressing an inquiry to this office. Marion Clawson, Director.

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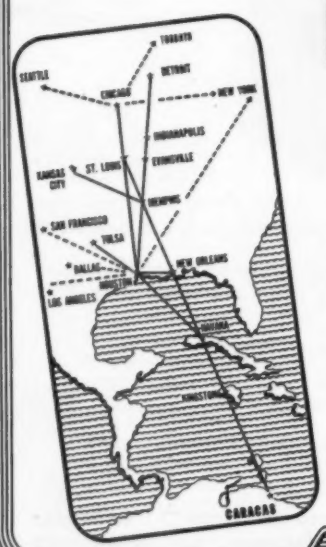

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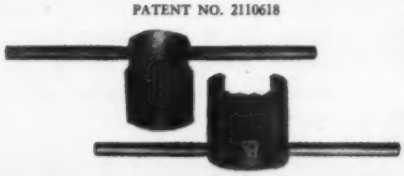

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Union Producing Co., the companies supporting the test, have agreed to drill the test approximately 1,000 ft. deeper. Currently, operators are conditioning hole so that coring can be continued.

Illinois-Ind.-Ky.

Dubois County Wildcat Completing as Producer

GALE & WALTERS 1 Struckman, NE NE NW 17-3s-5w, 2 miles southwest of Huntingburg, southwestern Dubois County, Indiana, pumped at the rate of 40 bbl. of net oil per day to open a new pool more than 12 miles from nearest other production. Pay zone is Rosiclare lime at 922-25 ft. With the oil was a small amount of water.

Another new pool is being opened in northwestern Daviess County, western Kentucky, where James C. Ellis and associates are completing their 1 Crabtree, W½ NE SE NE 14-O-27. The well, located about a mile northwest of West Louisville production and about the same distance southeast of the small Curdsville pool, pumped 35 bbl. of oil daily from Cypress sand at 1,867-75 ft. Hole was drilled to 1,877 ft. and plugged back to 1,875½ ft. with 5-in. casing at 1,862 ft.

C. E. Nickers 1 Ed Mann, SE NE NE 36-6s-14w, ¾ mile north of the north end of the Mt. Vernon pool and about the same distance southwest of production in the Farmersville area, in Posey County, Indiana, pumped 140 bbl. of net oil daily at completion in Mansfield sand at 1,194-1,204 ft.

Production of the wide-spread Union-Bowman pool, Pike County, Indiana, has been extended more than a mile to the southeast at F. B. Cline 1 Enos Coal Co., SW NW NW 17-1s-8w, completed pumping 40 bbl. of oil daily. Production is from the pool's Aux Vases and Rosiclare zones with casing perforated at 1,514-24 ft., 1,544-54 ft., and 1,573-77 ft.

The recently opened Ellery West pool, 2 miles south of Goldengate, Wayne County, Illinois, has taken on considerable additional importance with the completion of two more good wells, one extending production ½ mile southwest from the discovery well, and the other a southeast offset to the discovery. In the meantime, a fourth well for the pool is in the making as a northwest offset to the discovery producer. The latest prospective well, Tyley-Carter 1 Bowers, SE NE NE 22-2s-9e, got 630 ft. of clean oil and an additional 240 ft. of mud-cut oil in a drill-stem test of the pool's O'Hara pay zone, logged at 3,276-3,309 ft., and now has 5½-in. oil string run to 3,288 ft. for completion.

Aurora Gasoline Co. and associates 1 Scott, NE NE NE 27-2s-9e, ½ mile southwest of the pool's discovery well, flowed 51 bbl. of clean oil in the first hour and then settled to 30 bbl. per hour. Casing is perforated opposite the O'Hara pay at 3,292-3,303 ft. No acid was used. Skiles Oil Corp. 1 Etheridge, NE NW SW 23-2s-9e, southeast offset to the discovery well, flowed 50 bbl. of oil per hour. It, like the discovery well, is producing from both the O'Hara, at 3,272-80 ft., and the Rosiclare, at 3,297-3,307 ft. Its pay zones have been treated with 3,000 gal. of acid.

LEGAL

Sealed bids for oil and gas mining leases on certain trust lands on the Crow Indian Reservation, Big Horn County, State of Montana, will be received at the Office of the Superintendent, Crow Indian Agency, Crow Agency, Montana, up to 2:00 o'clock P.M., M. S. T., October 6, 1950. For further information, call or write L. C. Lippert, Superintendent, Crow Indian Agency, Crow Agency, Montana.

ILLINOIS SUCCESSFUL WILDCATS

Clay County: Skiles Oil Corp. 1 Hinterscher, SW NW SE 4-4n-8e, IP 206 bbl., Rosiclare 2,979-89 ft., TD 2,992 ft. (Opens new pool).

Edgar County: National Associated Petroleum Co. 1-A Maddock, SW SW SW 36-13n-11w, IP 26 bbl., Pennsylvanian 758-61 ft., TD 775 ft. (Opens new pay Elbridge pool).

C. H. Murdock 1 Bartmess, SE SW SE 5-12n-13w, IP 430,000 cu. ft. of gas, Pennsylvanian 465-80 ft., TD 480 ft. (Opens new pool).

ILLINOIS WILDCAT FAILURES

Clinton County: C. Stein et al. 1 Kaskoskia, NW NE NE 35-2n-3w, dry, TD 1,419 ft.

Crawford County: B. L. Hunt 1 Evans, NW NE NW 24-8n-13w, dry, TD 935 ft.

Kintop et al. 2 Wiman, NW NE NW 24-8n-12w, dry, TD 1,183 ft.

Edgar County: W. W. Dayton 1 Curtis, SW NE NE 1-12n-12w, dry, TD 1,390 ft.

Franklin County: Mark Twain Oil Co. 1-A Webb, NW NE NW 24-5s-1e, dry, TD 2,915 ft.

Jefferson County: Calbert Drilling Co. 1 Cothein, NE NE NW 30-4s-4e, dry, TD 3,273 ft.

Macoupin County: Mid-Continent Petroleum Co. 1 Beinhardt, SW SE NE 5-9n-6w, dry, TD 1,593 ft.

G. Williams 1 Bruhn, SW NW SW 25-7n-7w, dry, TD 577 ft.

Richland County: A. J. Slagter, Jr., 1 Toff, SW SE NE 30-4n-10e, dry, TD 3,063 ft.

Washington County: Miami Operators 1 Hoepker, SW SW NE 6-3s-4w, dry, TD 2,493 ft.

White County: J. L. Crawford 1 Sterling, NE NW SW 5-6s-8e, dry, TD 3,431 ft.

INDIANA SUCCESSFUL WILDCATS

Pike County: F. B. Cline 1 Enos Coal, SW NW NW 17-1s-8w, IP 40 bbl., Rosiclare and Aux Vases 1,501-51 ft., TD 1,612 ft. (extension Union-Bowman pool).

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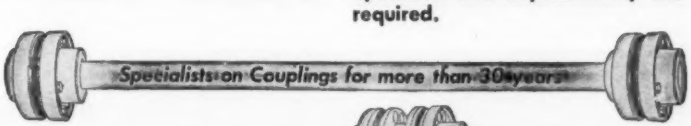

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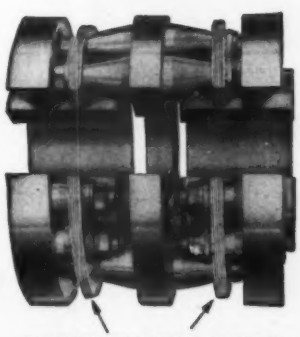

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Posey County: C. E. Nickers 1 Ed Mann, SE NE NE 36-6s-14w, IP 140 bbl., Mansfield 1,194-1,204 ft., TD 1,204 ft.

INDIANA WILDCAT FAILURES

Posey County: Herndan Drilling Co. 1 Weinzoppel, NE NW NE 24-6s-12w, dry, TD 2,785 ft.

Wells County: E. F. Cole et al. 1 Roberts, SE SW NW 20-26n-11e, dry, TD 1,014 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Daviess County: James C. Ellis et al. 1 Crabtree, W½ NE SE NE 14-O-27, IP 35 bbl., Cypress 1,867-75 ft., TD 1,877 ft.

WESTERN KENTUCKY WILDCAT FAILURE

Henderson County: Acme Drilling Co. 1 Neal, NE cor. NE SE SE 3-P-25, dry, TD 1,407 ft.

EASTERN KENTUCKY

ASHLAND.—In Breathitt County, 1-M-77, United Carbon Co.'s attempt to extend production to the southeast in recently discovered Springfork pool, has ended in failure as their 27 E. J. Evans fee is dry at 1,841 ft. in the Berea sand. Springfork pool produces from both Big lime and Weir sand, but both pays were barren in this test.

In Mine Fork pool of Magoffin County and located on Short Fork of Burning Fork, Oliver Jenkins has completed 3 Elkhorn Coal Corp. for 5 bbl daily from Weir sand at total depth of 1,318 ft. In Johnson County 7-R-79 Ashland Oil & Refining Co. has completed 3 S. Q. Kelly for 4 bbl. daily from Weir sand at total depth of 930 ft. Well is located short distance southwest of production in Martha pool.

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Humble Opens New Offshore Field in Timbalier Area

HOUSTON.—Humble Oil & Refining Co. has opened a new oil field off Terrebonne Parish, Louisiana, the first offshore strike since March. Its A-3 State, Lease 1428, Block 52, in the South Timbalier area, flowed at the rate of 313 bbl. of 38.3°-gravity oil per day through a 7/32-in. choke during latest gage on a 6-hour test ended 5 a.m. September 25. Gas-oil ratio was 4,100 to 1 and the shut-in tubing pressure was 2,325 psi. Tests will continue.

Producing horizon is a Miocene sand perforated for production from 12,111-14 ft. in 7-in. casing set at 12,259 ft. Depth of the original hole was 13,519 ft. but the well was plugged back to 9,796 ft. where it was sidetracked to present total depth of 13,015 ft. The discovery lies nearly 4 miles west and south of Humble's producer on State Lease 1027.

A.A.O.D.C. Meeting Set

TULSA.—Final plans have been completed for the annual meeting of American Association of Oilwell Drilling Contractors, which will be held at the Mayo Hotel here October 8-10.

Various papers which are important to the drilling-contracting business will be presented during the 3-day meeting, which will also include election and installation of new officers for 1950-51.

Among papers to be presented are: "Trends in Drilling Know-How," Dr. J. V. Pennington, Drilling Research, Inc.; "What Is Expected of the Oil Industry in Event of a Major War Effort," Lt. Col. Wilson A. Chapman, U. S. Air Force; "Results From the Training of Drilling Personnel," A. L. Franzolino, Southern Methodist University.

"Care and Maintenance of Slush Pumps," William J. Redman, Wilson-Snyder Division, Oil Well Supply Co.; "Analysis of Surface Casing Failures," B. B. Smith, Loffland Bros. Co.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that 4 units of land containing in all 440 acres in T. 16 S., R. 31 E., N.M.P.M., New Mexico, within the known geologic structure of the Robinson field, New Mexico, will be offered for oil and gas leasing through competitive bidding at 1 p. m., Eastern Standard Time, on October 11, 1950, when bids will be opened. Details of the lease offering, how and where to file bids and a description of the lands may be obtained by addressing an inquiry to the Manager of the Land and Survey Office, at Santa Fe, New Mexico, or to this office. Marion Clawson, Director.

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Monthly Completion and Footage Marks Topped by Record August Activity

by Philip C. Ingalls

DRILLING activity during the month of August broke all previous completion and footage records: completions were 4,149 wells, higher than for any previous month, and footage drilled exceeded the 15,000,000-ft. mark for the first time to set an all-time monthly high of 15,037,930 ft. These figures represent increases of 6.7 per cent in completions and 11.3 per cent in footage over the previous month, and gains of 23.9 per cent and 30.9 per cent, respectively, over August 1949.

Completion Comparisons

August vs. July 1950. — There were 261 more wells completed during August than during July. Texas led the gain with an increase of 257 more completions. Louisiana and New Mexico had increases of 60 and 40 completions, respectively. There were no other outstanding increases, but contrary to the over-all trend, the north central states (Illinois, Indiana, Kentucky, and Michigan) had 139 less completions during August than during July.

August 1950 vs. August 1949.—There were 799 more completions during August 1950 than during August 1949. Most of this gain in number of completions is accounted for by Texas with 566 more wells, a percentage increase of 54.7.

Success rates. — The average success rate during the month of August was 62.2 per cent with nearly 90 per cent of the successful wells being completed as oil or distillate producers. West Texas with a success rate of 82.4 per cent had the highest success rate of the tabulated areas, and nearly all of successful completions were oil wells. West Virginia had a success rate of 16.9 per cent to lead the total state figures with 64 per cent of the state's successful completions being gas wells. Pennsylvania, Ohio, Kansas, Oklahoma, Texas, Louisiana, Arkansas, Montana, New Mexico, California and the Ala.-Ga.-Fla. district all had success rates over 60 per cent.

Footage Comparisons

August vs. July 1950.—Texas accounted for over 33 per cent of the footage gain with an increase of 1,029,716 ft. over the July total. As with well completions, Louisiana and New Mexico had the only other outstanding increases with 282,829 and 230,779 ft., respectively. The north-central states decreased 247,845 ft. for the only district not recording a gain during this record-breaking month.

August 1950 vs. August 1949.—There were 3,555,149 ft. more hole drilled this year than last during the month of August. Here again it was Texas that accounted for most of the increase, having drilled 2,580,470 ft. more.

Depths.—During August 1949 completions averaged 3,428 ft. In August this year the average depth had increased to 3,624 ft. Though there were increases in every depth classification, as shown by the table below, the most outstanding was in the 5,000-7,500-ft. and 7,500-10,000-ft. classes where increases of 48 and 55 per cent, respectively, were recorded.

SUMMARY OF COMPLETIONS—AUGUST 1950

	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500-ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	60	30	0	30	60	0	0	0	0	0	86,000	§62
Pennsylvania	159	74	23	62	138	21	0	0	0	0	278,039	271
West Virginia	78	10	50	18	43	31	4	0	0	0	211,246	¶157
Ohio	89	35	19	35	54	35	0	0	0	0	174,857	145
Kentucky	114	40	23	51	81	33	0	0	0	0	232,929	126
Illinois	295	133	2	160	159	136	0	0	0	0	637,335	332
Indiana	142	58	3	81	114	28	0	0	0	0	254,458	189
Michigan	77	26	0	51	51	26	0	0	0	0	172,105	161
Kansas	337	164	41	132	68	267	2	0	0	0	1,089,337	417
Neb., Mo., Iowa	16	5	1	10	2	11	3	0	0	0	65,947	39
Oklahoma	500	297	19	184	134	248	93	11	14	0	1,762,787	759
Texas	1,601	1,033	55	513	417	601	424	134	22	3	6,833,618	1,321
North	247	128	0	119	128	83	36	0	0	0	686,180	174
West Central	222	88	4	130	104	104	14	0	0	0	592,997	125
West	518	434	2	82	81	153	236	36	10	2	2,579,147	446
Panhandle	82	47	29	6	8	73	0	1	0	0	250,313	128
East	126	82	6	38	22	56	25	23	0	0	601,518	71
Gulf Coast	214	131	5	78	22	69	64	50	9	0	1,248,803	219
Southwest	192	123	9	60	32	63	49	24	3	1	874,660	158
Louisiana	255	158	15	82	97	40	30	44	33	11	1,403,750	260
Northern	150	91	12	47	96	27	13	13	1	0	476,792	98
Southern	105	67	3	35	1	13	17	31	32	11	926,958	162
Arkansas	40	23	1	16	8	25	4	3	0	0	151,117	39
Mississippi	30	9	1	20	1	3	15	6	5	0	211,456	26
Ala., Ga., Fla.	6	4	0	2	0	6	0	0	0	0	24,201	7
Montana	42	27	2	13	24	16	2	0	0	0	98,729	69
Wyoming	59	28	2	29	5	37	10	6	1	0	272,898	‖147
Colorado	9	5	0	4	2	2	5	0	0	0	39,043	37
Utah	1	0	0	1	0	1	0	0	0	0	3,682	19
New Mexico	70	46	5	19	18	25	9	12	6	0	343,169	**124
California	168	110	5	53	35	87	29	9	7	1	690,827	200
Dakotas	1	0	0	1	1	0	0	0	0	0	400	4
Total August 1950	4,149	†2,315	267	*1,567	1,512	1,679	630	225	88	15	15,037,930	‡4,911
Total July 1950	3,888	2,135	232	1,521	1,547	1,515	556	180	78	12	13,504,973	5,155
Total August 1949	3,350	1,847	245	1,258	1,384	1,301	425	144	85	11	11,482,781	4,394
Cumulative 1950	28,295	16,157	1,840	10,298	10,412	11,266	4,417	1,461	648	91	103,359,351	....
Cumulative 1949	25,408	14,375	1,810	9,223	9,524	10,473	3,314	1,379	631	87	90,940,434	....

*Incl. 120 service wells: N. Y. 30, Pa. 55, Ohio 4, Ill. 4, Mich. 10, Kans. 3, Okla. 6, N. Tex. 3, W. Cent. Tex. 2, W. Tex. 1, E. Tex. 2. †Incl. 47 distillate wells: Okla. 5, W. Tex. 2, E. Tex. 12, Tex. Gulf 6, S. W. Tex. 2, No. La. 8, So. La. 7, Miss. 5. ‡Incl. all wells rigged up and/or drilling at end of month. §Incl. 3 Md. ¶Incl. 2 Va. ‖Incl. 3 Idaho. ** Incl. 5 Ariz.

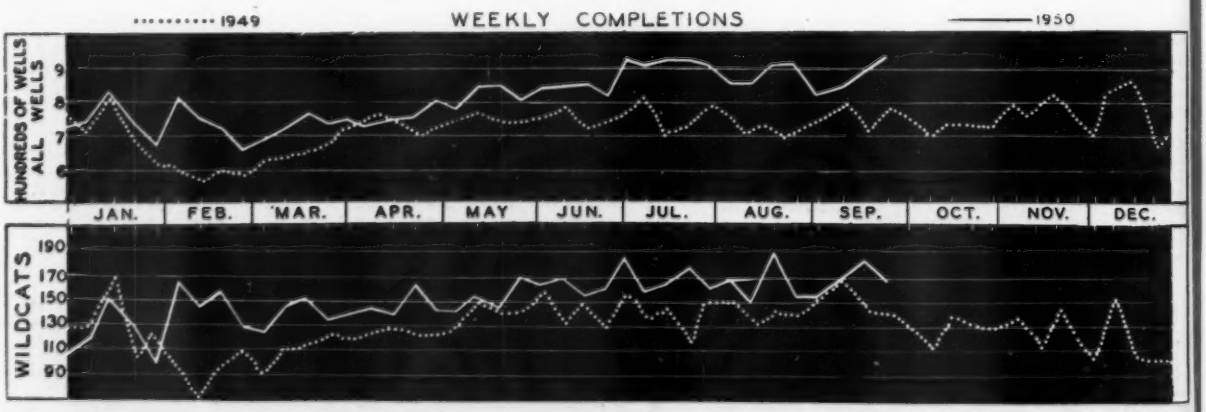
CURRENT STATISTICS

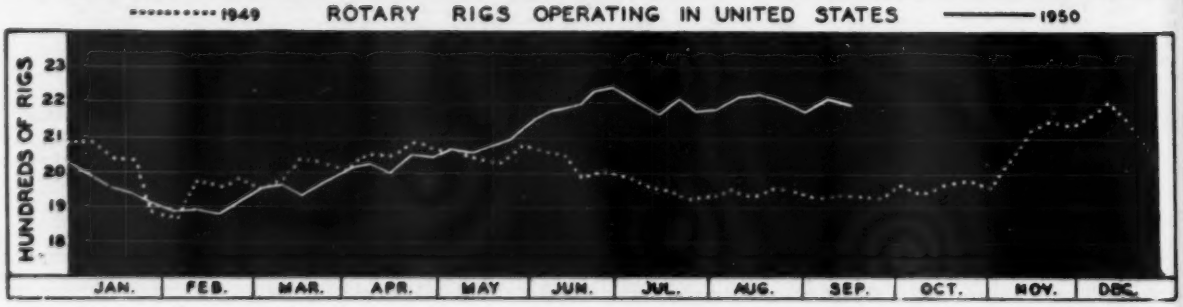
EXPLORATION

WEEKLY WELL COMPLETIONS . . . WEEK ENDED SEPTEMBER 23, 1950

	Total of all wells					Sept. 23		Wildcat completions and discoveries					Cumulative total, 1950				
	Comp.	Oil	Gas	Dry	Footage	1950	1949	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	16	8	0	*8	23,308	499	749	0	0	0	0	0	0	0	0	0	0
Pennsylvania	34	16	5	†13	56,876	968	1,196	0	0	0	0	0	0	0	1	2	3
West Virginia	8	0	8	0	24,613	483	367	0	0	2	0	2	0	0	17	16	33
Ohio	25	5	13	7	62,417	726	792	1	0	0	1	2	2	0	2	9	13
Indiana	37	11	4	22	65,619	1,206	978	2	0	0	2	4	42	0	1	193	236
Kentucky	25	10	5	10	42,998	830	693	1	0	0	2	3	20	0	1	68	89
Illinois	61	29	1	31	126,694	1,998	1,856	2	0	1	11	14	41	0	2	440	483
Michigan	18	9	0	9	43,506	637	731	1	0	0	3	4	24	0	4	213	241
Kansas	106	57	8	41	330,356	2,770	2,365	6	0	1	17	24	76	0	11	457	544
Nebraska	5	3	0	2	16,221	88	19	0	0	0	2	2	6	0	1	41	48
Oklahoma	85	47	0	‡38	263,872	3,930	3,153	2	0	0	11	13	121	6	15	486	628
Texas	372	235	15	122	1,528,854	11,934	9,861	9	3	1	63	76	368	32	84	1,893	2,377
North Central (Dist. 7-B & 9)	123	61	2	60	362,582	3,610	3,277	4	0	0	25	29	161	2	22	741	926
West (Dist. 7-C & 8)	93	74	0	19	484,654	3,578	2,354	2	0	0	13	15	72	2	4	360	438
Panhandle (Dist. 10)	39	29	8	2	121,583	676	715	0	0	0	1	1	1	0	2	14	17
Eastern (Dist. 5, 6, & 6-P)	18	10	0	8	62,863	847	615	0	0	0	5	5	13	4	3	145	165
Gulf Coast (Dist. 2 & 3)	46	28	4	14	268,622	1,686	1,476	1	2	1	6	10	63	14	30	277	384
Southwest (Dist. 1 & 4)	53	33	1	19	228,550	1,537	1,424	2	1	0	13	16	58	10	23	356	447
Louisiana	55	30	4	21	274,229	1,779	1,700	1	0	0	5	6	36	15	5	148	204
Northern	32	16	4	12	86,731	957	1,000	1	0	0	4	5	6	3	2	67	78
Southern	23	14	0	0	187,498	822	700	0	0	0	1	1	30	12	3	81	126
Arkansas	10	5	0	5	31,797	302	238	0	0	0	1	1	9	0	0	71	80
Mississippi	4	3	1	0	26,234	234	254	0	0	0	0	0	8	2	0	82	92
Southeastern States	0	0	0	0	0	46	36	0	0	0	0	0	1	0	1	26	28
Montana	10	1	0	9	13,761	185	194	0	0	0	0	0	1	0	0	30	31
Wyoming	9	6	0	3	53,241	417	433	1	0	0	0	1	18	0	0	54	72
Colorado-Utah	4	0	0	4	12,744	63	105	0	0	0	4	4	4	0	1	41	46
New Mexico	11	6	5	0	45,271	448	379	0	0	2	0	2	10	1	2	40	53
California	39	25	1	13	163,355	1,302	1,910	1	0	0	9	10	20	0	3	277	300
Miscellaneous	0	0	0	0	0	36	16	0	0	0	0	0	0	0	0	11	11
Total United States	934	506	70	358	3,205,966	30,881	28,025	27	3	7	131	168	807	56	151	4,598	5,612
Total previous week	898	485	48	365	3,338,005	....	....	17	0	7	159	183	780	53	144	4,467	5,444
Total September 23, 1949	789	449	62	278	2,924,000	....	....	19	2	6	111	138	700	66	148	4,079	4,993

Service wells included: *8, †12, ‡3.





DAILY AVERAGE PRODUCTION FOR WEEK

	Sept. 23 crude oil	B. of M. Sept. demand	Sept. 16 crude oil
Alabama	2,200	1,600	2,250
Arkansas	81,200	90,000	81,050
California	912,200	928,000	905,400
Colorado	67,100	67,000	61,900
Eastern	67,000	65,000	61,000
Florida	1,600	1,400	1,750
Illinois	173,200	188,000	181,900
Indiana	30,900	31,000	29,900
Kansas	313,800	306,000	305,150
Kentucky	27,900	30,000	27,300
Louisiana	577,750	590,000	578,000
North Louisiana	115,200	.....	115,450
South Louisiana	462,550	.....	462,550
Michigan	44,800	47,000	44,500
Mississippi	107,250	120,000	107,700
Montana	23,000	24,000	24,300
Nebraska	3,300	3,000	3,200
New Mexico	136,625	154,000	136,625
Oklahoma	461,300	460,000	463,200
Texas	2,620,800	2,260,000	2,663,550
Dist. 1 (Southwest)	30,800	.....	30,800
Dist. 2 (Southwest)	150,950	.....	150,950
Dist. 4 (Southwest)	235,250	.....	235,250
Dist. 3 (Gulf Coast)	454,625	.....	454,625
Dist. 5 (Eastern)	44,075	.....	44,075
Dist. 6 (Eastern)	104,250	.....	104,250
East Texas field	305,400	.....	305,400
Dist. 7-C (West)	66,450	.....	66,450
Dist. 8 (West)	905,950	.....	948,700
Dist. 7-B (W. Central)	75,150	.....	75,150
Dist. 9 (N. Central)	156,500	.....	156,500
Dist. 10 (Panhandle)	91,400	.....	91,400
Utah	3,600	4,000	3,600
Wyoming	164,300	170,000	164,100
Total United States	*5,819,825	5,540,000	5,846,375
Change from prev. week, down	26,550		
Canada	92,700	.....	101,600

Total U. S. production January 1-September 23 †1,400,667,065 bbl.
Same period last year (crude plus cond.) ..... 1,347,595,765 bbl.

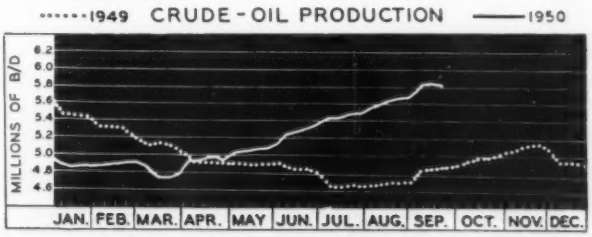
*Not including 96,880 bbl. condensate. †Including 25,870,915 bbl. condensate.

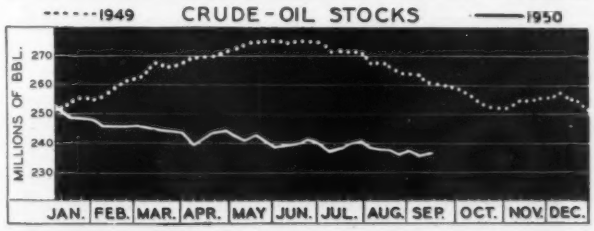
CRUDE-OIL STOCKS BY STATES OR ORIGIN*

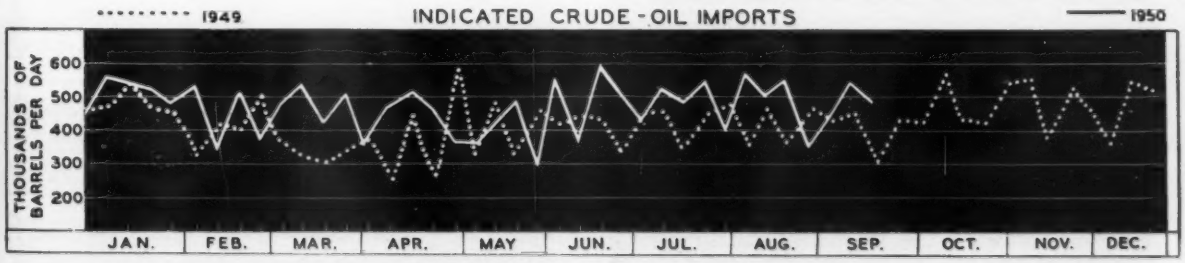
(Thousands of barrels)

	Sept. 16, 1950	Sept. 9, 1950	Sept. 17, 1949
Pennsylvania Grade	2,463	2,449	3,261
Other Appalachian	1,423	1,398	1,936
Illinois, Indiana, Michigan	9,783	9,590	12,612
Arkansas	2,909	2,903	2,646
Louisiana	14,302	14,459	14,433
North	3,153	3,153	3,511
Gulf	11,149	11,306	10,922
Mississippi	2,470	2,615	2,761
New Mexico	6,258	6,030	7,477
Oklahoma and Kansas	34,362	33,852	38,625
Texas	115,697	114,767	119,965
East Texas	13,689	14,256	17,673
West Texas	45,448	44,967	47,455
Texas Gulf	28,430	28,171	28,461
Other Texas	28,130	27,373	26,376
Rocky Mountain	10,459	10,776	13,886
California	30,987	31,385	35,989
Foreign	6,042	6,214	6,818
Total	237,155	236,438	260,409

*Bureau of Mines.





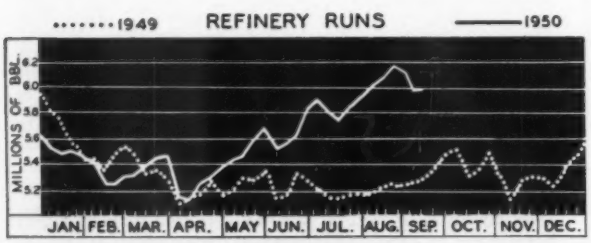


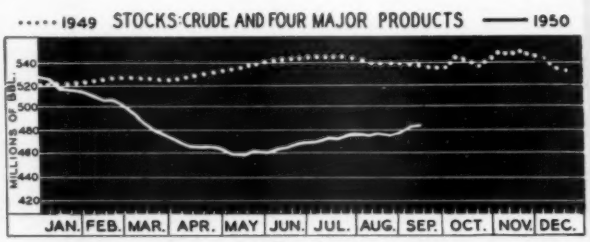
A.P.I. REFINERY REPORT, SEPTEMBER 16

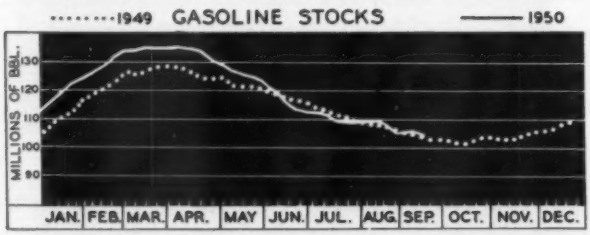
(Thousands of barrels)

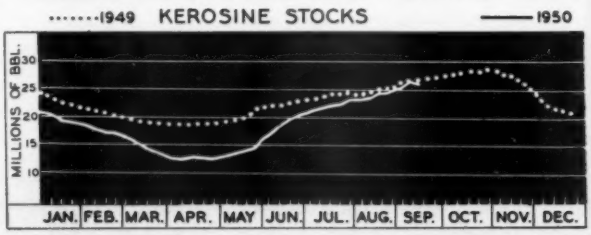
District—	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, September 1949				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	967	368.1	39.0	237.1	206.7	24,523	9,694	21,472	10,937	777	319.8	25.4	172.3	176.9
Appalachian:														
District 1	107	47.3	5.6	15.3	9.0	2,322	478	738	430	98	46.9	5.0	13.2	10.0
District 2	77	39.9	3.7	8.9	17.7	1,006	157	174	221	67	35.1	4.1	7.2	13.6
Ind., Ill., Ky.	937	501.3	63.3	164.3	140.3	21,323	5,563	12,380	4,405	925	504.7	57.6	126.8	142.0
Okla., Kans., Mo.	544	289.4	17.1	121.4	67.7	9,967	1,438	7,453	1,340	418	241.6	14.4	82.1	60.9
Inland Texas	198	125.7	11.6	32.1	32.0	3,300	504	1,316	720	214	140.5	10.4	27.9	42.4
Texas Gulf Coast	1,464	669.6	103.9	286.3	265.6	16,380	4,329	11,015	6,127	1,325	606.1	81.4	282.0	233.8
La. Gulf Coast	510	235.0	45.0	136.0	61.7	6,429	2,620	4,352	2,261	456	220.8	47.2	106.3	60.8
N. La. and Ark.	61	22.1	5.0	8.9	9.1	2,175	431	634	248	73	30.9	6.3	10.6	15.0
Rocky Mountain:														
New Mexico	11	5.6	.4	1.9	3.3	79	25	31	28	10	5.8	.2	1.7	2.6
Other Rocky Mtn.	195	83.3	5.4	35.7	31.9	3,190	523	2,069	873	194	89.9	5.7	34.9	33.6
California	912	416.7	10.7	139.8	320.7	13,611	725	12,502	14,618	870	375.1	12.1	136.6	318.4
September 16, 1950	5,983	2,804.0	310.7	1,187.7	1,165.7	104,305	26,577	74,136	42,208	5,427	2,617.2	269.8	1,001.6	1,110.0
September 9, 1950	5,971	2,799.3	310.3	1,127.3	1,183.6	106,381	26,640	71,597	42,727	.....	.....	.....	.....	.....
September 17, 1949	5,306	2,549.3	251.3	952.4	1,069.3	103,331	26,436	80,114	68,527	.....	.....	.....	.....	.....

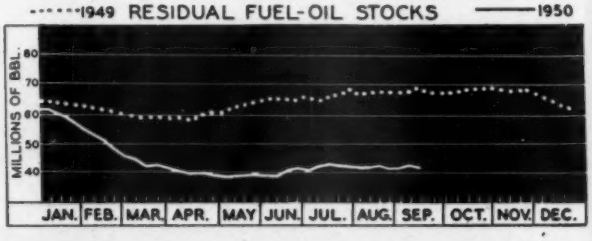
*At refineries including natural blended. †Finished and unfinished.

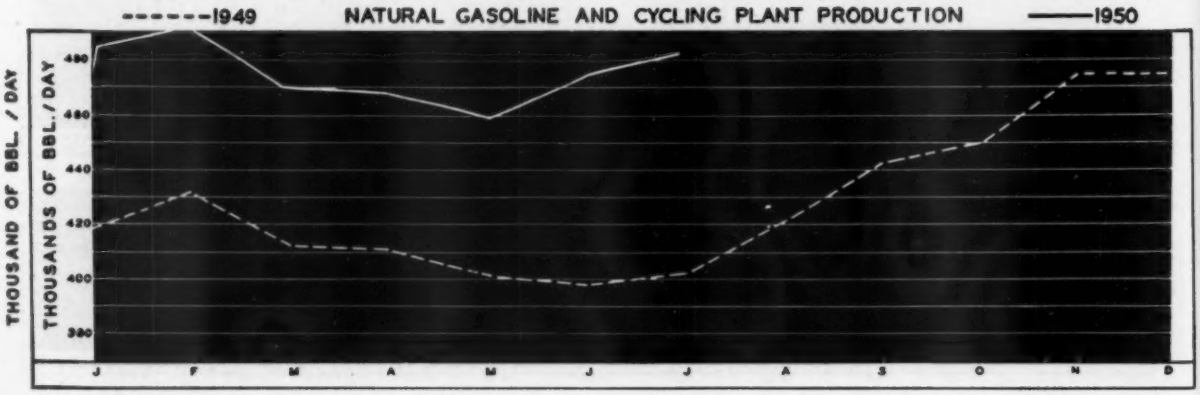












CRUDE PRICES

GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.69	....	....	....
19-19.9	1.77	....	....	....
20-20.9	1.85	$2.25	....	$2.12
21-21.9	1.93	2.27	....	2.14
22-22.9	2.00	2.29	....	2.16
23-23.9	2.08	2.31	....	2.18
24-24.9	2.15	2.33	$2.56	2.20
25-25.9	2.23	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	4.00
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

CRUDE from Scurry County, Texas, is bringing a better price. Magnolia Petroleum Co. announced price adjustments effective September 21, shifting Scurry County Canyon lime production to a schedule which covers most of the crude from North and West Central Texas. The new listing carries a top of $2.65 for 40° gravity and above compared with $2.58 under the old posting. Gravity differentials are still 2 cents for each degree change with the schedule bottomed at $2.33 for crude under 25° gravity.

Spot transactions on the Gulf Coast fuel market have dropped off to almost nothing. Most of the reported sales are for river barge movement.

The decline in spot sales of fuel on the gulf has been due to the fact that the Gulf Coast-New York Harbor price spread has not kept pace with the increase in transportation costs. Tanker rates for No. 2 fuel from the Gulf Coast to points north of Hatteras amounted to about 0.56 cent a gallon as late as last May. Today the rate is about 1.1 cents, but the spread between Gulf Coast and New York Harbor postings is only 1 cent. Spot operators can't pay for insurance, shrinkage, and terminal costs out of a loss of 0.1 cent a gallon.

Heavy-fuel rates have moved up even faster. The May rate was 26 cents a barrel compared with 59 cents reported but unconfirmed last week. The spread between New York Harbor and Gulf Coast postings for No. 6 is about 35 cents.

Total gasoline stocks dropped 1,258,000 bbl. in a 2-week period ended September 16 to 104,305,000 bbl., but most suppliers feel that there is little chance that stocks will go below 100,000,000 bbl. this season since high production rates have held reductions to 4,610,000 bbl. in the past 8 weeks.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotation of leading suppliers as of September 25, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅜-10½	12.5-12.75	10¾-11½
Premium gasoline, 86-88 octane	11¼-11⅝	13.5-13.75	11½-12
42-44 w.w. kerosine	8⅞-9	9.5	8½-8¾
No. 2 straw fuel oil	8⅛-8¼	8.5	7½-7¾
No. 6 residual	$1.65-1.75	$2.15-2.25	$1.80-1.85

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6¼	5¾	6
Grade 18-55	7.5	7.0	7.25

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	12.5
750 vis., No. 3-4 neutral	14.75
2,000 No. 5-6 neutral	16.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	26-27
200 vis., No. 3 neutral, 0-10 pp.	15.5-17.5

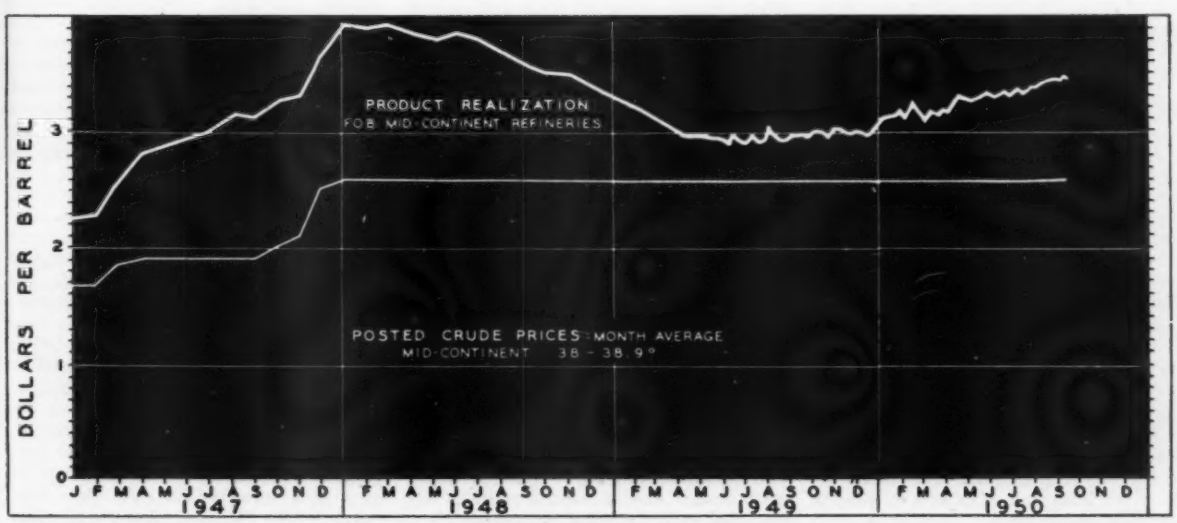
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	28
180 vis., 0 p.t. neutral	29

WAX

Mid-Continent

132-134 A.M.P.	5.0


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
POSTED CRUDE PRICES-1ST MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
0
1
2
3
J F M A M J J A S O N D
1947
F M A M J J A S O N D
1948
F M A M J J A S O N D
1949
F M A M J J A S O N D
1950

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.47 for week ended September 16, $3.50 for previous week, and $2.99 for September 1949.

EQUIPMENT MEN ... in the News

W. S. Thomas Named Byron Jackson Branch Manager

W. S. THOMAS

William S. Thomas was recently appointed branch manager of the Houston office of the pump division, Byron Jackson Co., Houston. Prior to this appointment he was branch manager of the San Francisco office of the company. Thomas is a graduate of University of California and of the Harvard School of Business. He started with Byron Jackson in July 1951, in cost accounting. In 1944 he was made submersible-motors production manager and held this position until 1946 when he became a sales engineer. He was appointed to the position of branch manager at the San Francisco office in September 1946, managing the sales of BJ pumps in the northwestern states.

Valve Division of General Metals Opens New Office

Announcement of the opening of new offices in the Stevens Building, Mineola, L. I., New York, has been made by Fred T. Miller, vice president, Adel Division, General Metals Corp., manufacturers of hydraulic valve equipment for industrial fields.

The opening of these offices and the closing of Adel's previous location at Stamford, Conn., is made to better serve Adel's customers in eastern territories, according to Miller.

J. Perry Barker will be in charge of the Mineola office and continues to act as Adel's eastern representative.

At the same time, E. M. Storer, Jr., hydraulic design specialist, associated for the past 11 years with Glenn L. Martin Co., will join the Adel organization as a sales engineer.

Sugden Boosted in Manning, Maxwell & Moore Division

C. N. Sugden has been appointed assistant director of engineering for gages and instruments and Robert Ingham, succeeding Sugden, chief engineer for gages, Harry S. Moore, director of engineering and development for Manning, Maxwell & Moore, Inc., has announced.

Sugden joined the company in 1920 in the drafting department and in 1929 was made chief draftsman. In 1934 he was placed in charge of planning, moving from that position to chief engineer for gages in 1938.

Ingham joined the company in 1941 as a development engineer. Previously, he had been an instructor of mechanics in the National Defense Training Program and a design engineer for a gage manufacturer. He is a graduate of Drexel Institute of Technology.

Stubble Named to National's Eastern Division Duties

C. J. STUBBLE

J. C. WOODS

National Supply Co. has announced the appointment of Clarence J. Stubble as assistant manager of the company's eastern division with headquarters at Pittsburgh. At the same time the company made known the appointment of J. C. Woods as assistant manager, eastern division, with headquarters at Toledo.

Stubble has been with National Supply since 1934 when he joined them at Bolivar, N. Y., as a store clerk. He has held the positions of store manager and field salesman and had been a district manager before moving to his new position. Woods joined National Supply at Fort Worth in 1944. Previously, he had been resident manager of Bethlehem Supply Co. and has been associated with the oil industry since 1926. Before taking up his new duties in Toledo, he had been a National Supply sales representative at Houston.

General American Opens Division Office in Tulsa

General American Transportation Corp. has announced the opening of a new plate and welding division office in Tulsa.

J. D. Camp will represent General American for the sales of all fabricated equipment as well as Wiggins conservation structures and Wiggins gasholders. Camp, who has been associated with General American as a member of the sales force for about 5 years, will maintain offices in the First National Bank Building.

General Industrial Names Two Representatives

General Industrial Supply Corp., Fort Worth, has announced the appointment of two special representatives, Fred Prideaux and Ray Rimbey, both specialists in the industrial and electrical field. Prideaux, formerly with Peerless Pump Division and a graduate of Stanford University, will represent General Industrial in the Brownwood, Abilene, and San Angelo area.

Ray Rimbey, a graduate of Illinois College, will represent General Industrial in the Wichita Falls area. He, too, has had wide experience in the industrial and electrical supply business, having spent several years in the building and construction trade.

Both of these men will be calling on oil-field accounts, electrical contractors, and industrial plants in their respective areas. General Industrial Supply Corp. also has representatives in Fort Worth, Midland, Odessa, Houston, and Tulsa.

Enterprise Changes Corporate Identity

P. I. BIRCHARD

Enterprise Engine & Foundry Co., Los Angeles, manufacturer of marine and stationary diesel engines, process machinery, and commercial-oil burners, has changed its corporate identity to Enterprise Division, General Metals Corp., with Paul I. Birchard named vice president and manager, according to an announcement by William E. Butts, head of Enterprise operations.

The change became effective upon the consolidation of Enterprise with two other nationally known manufacturing concerns, Adel Precision Products Co., of Burbank, Calif., and General Metals Corp., with California plants located at Los Angeles and Oakland and a third at Houston. Butts, who was named president of the new corporation, also announced that there will be no change in the existing operations or policies of any of the divisions. Officers of the new corporation, in addition to Butts as president, are William A. DeRidder, head of both General Metals and Adel, chairman of the board; W. E. Clayton, Jr., secretary; and Roy C. Menzel, treasurer.

Chiksan Rocky Mountain Branch Moved to Salt Lake

B. P. RAGSDALE

Chiksan Co., Brea, Calif., has established sales headquarters for the Rocky Mountain area in Salt Lake City with B. P. Ragsdale in charge. With a broad experience gained as a member of Chiksan's engineering department, service representative, and sales engineer in the southern California territory, Ragsdale will handle sales and service on Chiksan, WECO, Anchor, and Okadee products.

Chiksan's Rocky Mountain headquarters were formerly in Denver, with Al Myers as sales representative. Myers has resigned to enter business for himself.

Peterson Elected Peabody Engineering Vice President

At the recent meeting of the board of directors of Peabody Engineering Corp. of New York, Eric G. Peterson was elected to the board of directors and appointed vice president.

In addition to his new duties he will continue to fill the position of general manager in charge of both the New York office and the Stamford plant.

C. A. Polk Named Sales Manager of McFarland

CLARKE A. POLK

Clarke A. Polk, formerly assistant general manager of Sterling Packing & Gasket Co., has been appointed sales manager of McFarland Manufacturing Corp., Houston, manufacturers of chemical injectors, McFarland hydrostatic testing pumps, and blowout-preventer closing units.

Polk, who has been in the oil-industry equipment - manufacturing business since 1933, is well known throughout the industry.

Trainer Elected President Of American Brake Shoe

Maurice N. Trainer, first vice president of American Brake Shoe Co., was elected president of the company at the board of directors meeting September 13. William B. Given, Jr., president for 21 years, was elected chairman of the board.

Trainer is a graduate of University of Pennsylvania. He joined Brake Shoe in 1916 as a brake-shoe inspector and moved up through the sales departments of the company. In 1938 he became president of the brake-shoe and castings division. In 1943 he was elected first vice president and in 1944 he became a director of the company. He is also president of Dominion Brake Shoe Co., Ltd., a Canadian subsidiary.

Given joined Brake Shoe in 1911 as secretary to the president. He became assistant vice president in 1919 and vice president in 1921. He was elected president in 1929.

Western Geophysical Moves Eastern Division Offices

B. B. STRANGE

Headquarters of the eastern division of Western Geophysical Co. of America have been transferred from Natches, Miss., to Shreveport, according to an announcement by Henry Salvatori, president. The eastern division remains under the direction of Booth B. Strange, vice president, who first joined Western Geophysical as a computer in Texas in 1936. Later he was party chief in the San Joaquin Valley of California; Texas, Mississippi, and Alabama.

In 1942 Strange was appointed supervisor in charge of the entire eastern division, and has since been responsible for the direction of seismograph and gravity operations in the Mid-Continent, Gulf Coast, and eastern states. He was elevated to a vice presidency following the recent organization of Western Geophysical Co. of America.

Nitschke Joins Rockwell As Project Engineer

R. Chris Nitschke has joined Rockwell Manufacturing Co. as a project engineer on the company's petroleum products. Nitschke was formerly employed by Standard Vacuum Oil Co. as assistant chief engineer. From 1941 to 1943, he headed his own consulting-engineering operation in New York City which was dissolved when he entered the Armed Services as a petroleum specialist. He spent 1946 in South America as a project engineer for M. W. Kellogg. Just prior to joining Rockwell he was with A. G. McKee Co. of Union, N. J. He received his basic engineering training at Victoria College in England and after coming to the United States did petroleum-engineering work at Columbia University and University of Tulsa.

Foster Wheeler Names Swem To International Division

L. A. SWEM

Foster Wheeler Corp. has announced the appointment of Lee Allan Swem, as vice president in charge of the newly formed international division. The international division will be responsible for foreign business of the corporation and will coordinate the activities of subsidiary companies in Canada, England, and France.

Swem joined Foster Wheeler in 1936 as patent counsel and was elected vice president in charge of the legal department in 1948.

Continental Announces Changes in Sales Staff

Continental Supply Co., Dallas, has announced the following changes in management personnel:

G. H. Slack has been named manager of the Casper, Wyo., store. He was former sales representative at that point. John J. Dean, store manager at Harvey, La., has been transferred to Alice, Tex., to serve in the same capacity; Cooper Vaughn has replaced H. B. Harris as store manager at McAllen, Tex., the latter being transferred to the North Texas area; and W. R. Everett has been appointed manager of the Post, Tex., store being transferred from Pampa, Tex., where he served in the same position. He is succeeded as manager in Pampa by J. B. Patterson, former field salesman at that plant.

Carr to Head Edward Valves Engineering, Research

L. H. CARR

Laurence H. Carr has been named director of engineering and research for Edward Valves, Inc., East Chicago, Ind.

Carr has been a member of the Edward technical staff since 1936 and was previously chief metallurgist. In his new position he will be responsible for consolidating the development functions of engineering research, product engineering, and technological specifications for process control.

A graduate of the University of Chicago, Carr is an authority on metals for high-pressure and high-temperature service.

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Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

CLASSIFIED ADVERTISING

UNDISPLAYED CLASSIFIED 12c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

DISPLAY CLASSIFIED
$12.00 a column inch one issue . . .
10% Discount three or more issues.

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES. E. A. KELLY, BOX 861, OKLAHOMA CITY. PHONE 5-6407.

WELL equipment. New and used spudders, rotaries, core drills, all sizes and types. Cable tools, drill pipe, bits, pipe. Fishing tools rented. Everything for well service. Pressey & Son, Pueblo, Colo.

FOR SALE: 300 Amp Westinghouse welding machine powered by 6-BK Waukesha engine. Completely overhauled. Less than 50% of new price. Melton Supply Company. Box 1360, Seminole, Oklahoma.

FOR SALE: 10—10,000 gal. cap. 3/8-in. Shell ½ in. Heads Clean Horiz. Steel Storage Tanks f.o.b. Pittsburgh. Lestan Corp., Rosemont, Pa.

BARGAIN FOR QUICK SALE

Large Steam Rig Complete Ready to go. 14x14 Engine, 18" & 20" Pumps, 10,000' 4½ Drill Pipe, 136' Drk All 300 Ton Equipment. Everything Good Condition. **McDaniel & Beecherl Drlg. Co.,** 521 Republic Bank Bldg., Dallas, Texas, or Phone 3651, Odessa, Texas.

FOR SALE

9—230 H.P. Bessemer Type 10 Engines with compressors, Steel Buildings, Valves and Fittings complete for installation. Located Salem, Illinois Oilfield.

ENGLE PETROLEUM, INCORPORATED
Box 655, Evansville, Indiana
Telephone 5-5179

EQUIPMENT FOR SALE

2 New Hydraulic Shot Hole Drill Rigs at Special Price. Capacity, 400' of 3" hole with 2⅜" drill pipe comprising 1½ ton Ford truck, 25' 6" tubular mast with double acting hydraulic rams to provide 10' continuous non-chucking stroke, hydraulic operated winch, hydraulic powered rotary table, hydraulic rotary table push down, G-D 4 x 5 mud pump, swivel, 49 sections of 2⅜" drill pipe 10' long and complete accessory equipment.
Write or call:
C. R. ATHY, c/o International Derrick & Equipment Co., Atlantic Bldg., Dallas, telephone RI-1031

8" PIPE FOR SALE

Approximately 400 miles of 8"—29.02# line pipe being taken up. This pipe was used in a 650# Pressure Products Line. Pipe Subject to Prior Sale F.O.B. Pittsburgh District.

Wire or Write if interested
Box 574, Tulsa, Oklahoma

EQUIPMENT FOR SALE

6,218 FEET 7" O.D. 17# new seamless casing H-40 Rg 2 @ 2.90 ft. Phone 5-8850, Tulsa.

RECONDITIONED money - saving Franks SA-4500 Rotary Drilling Rig equipped with 96-foot derrick and rotary table. Write: Box D-681, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

7500' 2" xx seamless pipe approx. 400' new 16" bell & spigot 150# cast iron pipe—at mill price.

BOX 574, Tulsa, Oklahoma.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

EQUIPMENT FOR SALE

FOR SALE: 2—36-L Bucyrus Erie Spudders complete with cable tools. THE SANDY SUPPLY COMPANY, WOOSTER, OHIO.

FOR SALE

Hydraulic Casing Pulling Units, Hydraulic Jacks, Casing Spiders, Rings & Slips. Also,
Skid Mounted Cementing Unit, Complete.
Write or Call

OKLAHOMA MACHINE & SUPPLY CO.
Phone 780 Ada, Okla. P. O. Box 997

FOR SALE

1000 ft. of 3" upset tubing. Like new. 80c per ft.

4000 ft. 2⅜" range 1 drill stem. Hughes Acme tool joints. Like new. $1.50 per ft.

1550 gal. Army Air Force tank and trailer—new. $750.

Four 700 gal. glass insulated skid-mounted tanks. $300. Perfect for winter work in Wyoming and Kansas.

CLEMENS EXPLORATION
Box 136, Princeton, Ind.

PIPE FOR SALE

NOW AVAILABLE—150 Miles 8⅝" OD Strictly #1 Grade Used 28.55# Welded Steel Line Pipe Double Random Lengths Beveled Ends. Located Dallas-Corsicana area.

Standard Pipe Supply Company
P.O. Box 243, Houston 1, Texas

FOR SALE

75,000' 2⅜" O.D. 3.75# & 4# Good Used Lapweld Line Pipe, 11½ V-Thread.

125,000' 3" Standard 7.57# Good Used Lapweld Line Pipe, Machine Cleaned, Torch Beveled Ends 30°. Available for inspection first week of October and shipment within two weeks, FOB Illinois.

125,000' 4" O.D. x .160 Wall Seamless 6.5# Good Used Light Weight Line Pipe to be taken up in 30' to 40' Lengths, FOB Cars Near Borger, Texas.

40,000' 4" Standard 10.79# Good Used Lapweld, P. E. and T. & C.

25,000' 5" O.D. x .438/.563" Wall New Seamless, 20'-32' Lengths.

100,000' 6⅝" O.D. 18.97# Good Used Lapweld, Machine Cleaned, Torch Beveled Ends.

ALSO LARGE QUANTITIES OF 8" AND 10" USED LINE PIPE AVAILABLE

CASING & TUBING

7,000' 2⅞" O.D. 6.4# New Seamless, Range 2, 10 Round Thread Regular Tubing.

10,000' 8⅝" O.D. 25# Used Lapweld Casing, New Threads and New Collars.

3,000' 10¾" O.D. Used Lapweld Casing, New Threads and New Collars.

FOR FURTHER INFORMATION, WIRE OR PHONE AT ONCE

A. J. STRUBEL
SIDney 1791 . . . 4946 Murdoch, St. Louis, Mo.

EQUIPMENT FOR SALE

FOR SALE: Long wheelbase heavy duty tandem truck driven 12,000 miles. Ideal for drilling rig or heavy workover unit. Fred R. Holland, 7403 Bankhead Highway, Fort Worth, Texas.

1—36-L Bucyrus Erie Drilling Machine. 1—24-L, also 1—Keystone No. 80. 7" seventeen and twenty pound casing. 2" Tubing and Rods. These machines are practically new and can be inspected on drilling site. Contact R. F. McMahan, Taylor 7253 or Taylor 4116, Louisville, Kentucky.

NATIONAL "50" Compound Double Drum Rig 126' Cantilever L. C. Moore Mast 10' substructure. 6,000' 4" drill pipe. This rig complete and in excellent condition. P. O. Box 205, Sta. B, Bakersfield, California.

DRILL PIPE

10,000 ft. 3½" OD used seamless, weighing approx. 13# per foot, with tool joints.

USED SEAMLESS STEEL TUBING
Plain End Beveled for Welding

75,000 ft. 2¼" OD, approx. 2.90# per ft.
25,000 ft. 3½" OD, approx. 5# per ft.
25,000 ft. 4" OD, approx. 6# per ft.
25,000 ft. 5½" OD, approx. 9# per ft.

All reconditioned, hydrostatically tested to 850# pressure.

• • • • • •

18,000 ft. 6" OD used electric welded steel pipe, approx. ⅛" wall, 24' lengths.

• • • • • •

All material guaranteed in first-class condition. All ready for IMMEDIATE SHIPMENT.

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New and Guaranteed Used STEEL TANKS, Riveted, welded and bolted, in all capacities; also WOOD TANKS.

A. GREENSPON PIPE CO., INC.
3615 Olive St., St. Louis 8, Mo.
LUcas 5651

SPECIAL OFFERING

12' Fractionating Columns

TOWERS—A-1 Condition
Immediate Delivery

One Stripper Column—12' I.D. x 66' tangent to tangent x ¾" thick shell and heads, ASME-API code constructed stress relieved and radiographed, 29 Carbon Steel trays and caps on 2' spacing, 100# @ 200° F., mounted on 12' I.D. x 9'4" high x ⅜" thick skirt.

Two Extractor Columns, 12'6" I.D. x 85'5" tangent to tangent x 1" thick shell x ⅝" thick hemispherical heads, 40 Carbon Steel trays on 2' spacing, 150# @ 300° F., radiographed, mounted on 12'6" I.D. x 16'7" high skirt.

Write, Wire, Phone for Listings

DULIEN STEEL PRODUCTS, INC
of Washington
P. O. BOX 667
COTTON VALLEY, LA.
PHONE: COTTON VALLEY 26

EQUIPMENT FOR SALE

WAR SURPLUS MACHINERY
Gaso, Byron Jackson, Aurora, Wayne, Lombard & Hale Fire Pumps with Engines, 1½ to 25 KW Generator Sets or Light Plants, Engines, Suction Hose, Fire Hose, Victaulic Couplings & Etc. Write for listing. H. A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

TO SETTLE ESTATE: Two hydraulic casing pulling machines, mounted on skids, complete with small tools, also extra equipment for large size casing. One unit with friction clutch winch. Sell as one lot only. Reasonably priced. Located Tulsa. Box D-686, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 1942 Model Fort Worth Jumbo "C" Spudder in good repair and complete with tools. Skid type Advance Rumley pipe pulling unit capable of 4000' well servicing also in good condition. Large supply of cable tools also for sale. G. W. Hicks, Moline, Kansas.

FOR SALE

Approx. 30,000' 8" PE used line pipe, cut out in double random lengths. Located at Lovell, Wyoming.

Brown Pipe & Machinery Co.

P.O. Box 2368 **Phone 3-9391**
Corpus Christi, Texas

BUTANE AND HOT OIL PUMPS

1—Slightly Used Dean Bros. 8"x 7"x18" Simplex Close Clearance Pump, For Liquid Petroleum, 90 GPM—400 PSIG, Ea.. $750.00
1—Slightly Used Dean Bros. 12"x 7"x18" Simplex Close Clearance Pump, For Liquid Petroleum, 90 GPM—400 PSIG, Ea.. $750.00
1—Slightly Used Union 14"x8"x 12" Simplex Hot Oil Pump, Special Forged Steel Fluid End, 750# 650° F. 100 GPM, Ea. $500.00
1—Slightly Used Snow 10"x4½"x 12" Duplex Hot Oil Pump, Special Forged Steel Fluid End, 750# 650° F. 148 GPM, Ea. $500.00
2—Slightly Used Union 7½"x4½" x10" Duplex Hot Oil Pumps, Special Forged Steel Fluid End, 750# 650° F. 132 GPM, Ea. $500.00
ALL HOT OIL PUMPS TESTED 1200#

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GOOD USED CONDITION
Immediate Delivery

2 inch—40,000 feet.
3 inch—35,000 feet.
4 inch—55,000 feet.
6 inch—5,000 feet.
8 inch—8,000 feet.
10 inch—1,500 feet.
12 inch—1,500 feet.

Subject to Prior Sale.

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2nd and Riverview (C-629)
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THatcher 9243

EQUIPMENT FOR SALE

CASING, TUBING, LINE PIPE FOR SALE: Good used lap weld 2" to 10¾". Reasonable prices. Everything in cable drilling tools, rigs, belts, drilling engines, surplus wire lines. TRI STATE TOOL AND SUPPLY CO., Box 827, Parkersburg, W. Va. Phone 7-5121.

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OAK AND CYPRESS BREWERY TANKS

4—Size 10' x 17', closed 2¼" staves, manholes, etc..... $500.00 ea.

All clean, knocked down, F.O.B.

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Route #1
Burrton, Kansas **Telephone 2-1006**

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We are dismantling the Sinclair Refining Co. property in Kansas City, Mo. The following tanks and equipment offered at attractive prices for quick sale and removal.

NO.	CAPACITY	SIZE
3	49,363 Gals.	20' 0 ¼" x 21' 2"
1	49,363 Gals.	20' 0 ⅛" x 21' 2½"
2	17,973 Gals.	12' 0 ⅛" x 21' 3"
1	25,000 Gals.	13' 0 ⅝" x 25' 9⅜"
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Also many smaller tanks, valves, pumps and other equipment.

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AT SURPLUS PRICES

Catalog No. 1057 0-3000 pound gauge illustrated.

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HYDRAULIC CASING PULLING Machine: 7' jacks, 3-ram skid-type unit. N. R. Bennett, 111 South Division, Sapulpa, Oklahoma. Phone 1828 (after 4 p.m.).

FAILING 3000' capacity truck mounted rig, Buda powered, 55' mast rack 40' pipe, priced to sell. Box D-692, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

9—Type K New Double Reduction Pumping Units suitable for 1000' wells with 2" tubing. Price $375.00 each, less counter weights, foundation bolts and motor. FOB shop.

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P.O. Box 997, Ada, Okla. Tele. 780

FOR SALE

4—Fairbanks-Morse ZC-346 Pumping Engines complete with Type J Clutch and Sheaves. Two Units practically new and all in good running condition — Price $3750 for four engines or $1000 each. Available for inspection—Lamesa, Texas. Write, wire or call: **McMillian and Peterson, P. O. Box 1787, Phone 1471, Midland, Texas.**

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Ph. 9-9632

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CASING, wanted 9⅝" OD x .352" wall, #1 used. Cut 15'6" long. No coupled lengths acceptable. Torch cut ends acceptable. Advise price, origin and number of lengths available. JULIUS M. FOGELMAN, 1649 Perkiomen Ave., Reading, Penna.

WANTED TO BUY: All steel spudder of 2000 to 4000 foot capacity, with or without tools. Give cash price and location. Donald McCort, Atlas Star Route, Barnesville, Ohio.

WANTED: L.P.G. Code Tanks 150 to 400 bbl. capacity. Wood River Oil & Refining Co., Inc., 321 W. Douglas, Wichita, Kansas, Telephone 5-5674.

WANTED TO BUY: 16" O.D. and 10" O.D. 8 or 10 thd. 13⅜" and 9⅝" 8 thread collars, new or used. Box 574, Tulsa, Okla.

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Pipe Threading Machines

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Landis or Bignall & Keeler with Landis Heads. Machines must be in good working order with individual motor drives. Give complete description including make, model and serial numbers, width of dies or chasers, motor specifications and prices.

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Box D-606, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: 160' of 16" OD, ¼ to 5/16" wall, PE, RL pipe. Must be good, new preferred. Judd & Son, Shullsburg, Wisconsin.

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4,000 or 5,000 bbl. complete refinery that can be dismantled and moved export.

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Only Experienced Men Need Apply.

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B. S. degree preferably Mechanical Engineer with 1 to 2 years pipeline design engineering experience to work for pipeline company in developing economic and hydraulic studies for proposed lines and stations and to work generally in all phases of pipeline engineering. Occasional travel for short periods. Please indicate interest promptly.

Write Box D-691, The Oil and Gas Journal, Tulsa, Oklahoma

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Give full information, experience record and salary expected.

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PETROLEUM Engineer or Geologist with experience in evaluation and subsurface studies in Gulf Coast wanted by sound independent. Age 30-45. In application state salary expected and enclose college transcript. Box D-631, The Oil and Gas Journal, Tulsa, Oklahoma.

Maintenance Mechanic, First Class for Maintenance Repair, overhaul, and trouble shooting on 400 to 1,000 H.P. 2 and 4-cycle Clark, Worthington, Ingersoll-Rand, Steam and Gas Engines, Turbines, Pumps, Gear Boxes and Reduction Gears. In Celanese Chemical Plant in the Corpus Christi, Texas, area. Permanent job at a rate of $2.10 per hour. Experience desired. Selected applicant will be notified to report for personal interview and a physical examination.

In letter, applicant should give his complete work history with description of duties performed, equipment worked on, physical description, age, and number of dependents.

Address replies to
CELANESE CORPORATION OF AMERICA
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PROJECT ENGINEER

Prominent Engineering and Construction Company, located in New York City, requires Project Engineers to coordinate and direct engineering work in connection with the design and construction of petroleum and chemical plants. M.E. or Ch. E. graduate with practical petroleum refinery engineering and construction experience required. Position is permanent with excellent promotional opportunities. Detailed resume of experience and photograph desired at

Box D-688

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

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CHIEF OPERATOR: Minimum five years' all-round refinery experience particularly with precise fractionation including operating foreman experience; capable directing refinery utility services. Graduate chemical engineer preferred.

OPERATORS: Experienced shift operators capable supervising plant and utilities operations especially precise fractionation; general over-all refinery experience necessary.

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INSTRUMENT MAN: Thoroughly experienced capable assuming responsibility of instrument department.

Write: Box D-665
The Oil and Gas Journal,
Tulsa, Oklahoma

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FOREIGN and Domestic Oil Employment Directory covering the oil industry, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla.

Instrument Repairman, First Class to work in Celanese Chemical Plant in the Corpus Christi, Texas, area. Permanent job at $2.10 per hour. Must be capable of repairing, overhauling, installing, and doing general trouble shooting on all types of Automatic Control Systems; such as Taylor, Foxboro, Brown, Leeds-Northrup, Fisher, and Westcotts. Must be acquainted with the general operations of towers, furnaces, boiler equipment, and be qualified to work from Engineering Blue Prints and Specifications.

In letter, applicant should give his complete work history with description of duties performed, equipment worked on, physical description, age, and number of dependents.

Address replies to

CELANESE CORPORATION OF AMERICA
Attention: Employment Manager, P. O. Box 148, Bishop, Texas

SITUATIONS WANTED

GRADUATE ENGINEER, 28 yrs., married, with major company experience in Production and Drilling desires job with aggressive contractor or independent producer. Box D-687, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER-PRODUCTION SUPERINTENDENT. Experienced drilling, production, and geology in Kansas and Rocky Mountains. Ten years superintendent sales and operations major technical service company. Three years production superintendent independent producer and refiner. Experienced supervision and administration complete drilling and producing programs with excellent record for maximum results at minimum cost. Box D-679, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION—OIL EXECUTIVES

Do you need an experienced, honest, sober and aggressive assistant to relieve you of many responsibilities. Texas University Graduate B.B.A. degree, additional courses in Geology and Petroleum Engineering. Draft exempt, age 38, married, 16 years broad experience in all phases of Oil Industry including planning, organization and direction of accounting, production, drilling, purchasing, and Geological Departments. Also experienced in refining, recycling, repressuring, joint venture operations, leasing and promoting drilling deals. Desires connection as assistant to owner of aggressive Independent Oil or Drilling Company with heavy responsibilities. Best of references as to character and ability. Prefer Texas location but will consider out of state. Available October 1st, Interview desired immediately. Salary $750.00 per month. Please contact Roy Garner, 2612 Fowler Street, Phone Franklin 1789, Dallas, Texas.

GRADUATE GEOLOGIST: Age 28, two degrees, three years' experience, major company, desires position in geological, scouting or land department of progressive company. Box D-675, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLING Contractor operating in West Texas and New Mexico desires to contact small or medium-sized independent oil company who needs an operating manager. Personal interview desired. Twenty years experience in all phases of the oil industry. Address replies to Box D-644, The Oil and Gas Journal, Tulsa, Oklahoma.

AVAILABLE OCTOBER 15TH, high class man, 27 years experience, now employed as general manager of partnership operating oil producing and ranch properties South Texas. Change necessary account death of partner and sale of properties. Am also experienced accountant, tax, office and field management. Box D-696, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPE LINE corrosion and communications engineer desires to advance by changing. Present responsibilities include complete supervision of extensive radio and cathodic protection facilities major gas and electric company in the Northwest. Licensed radio operator experienced with all phases microwave communications. Age 33, ten years in pipe line and allied fields, will consider foreign assignment. Box D-694, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

SALES MANAGER with 15 years experience in Technical Sales work, covering Texas, Oklahoma and Louisiana oil fields. Also a Mechanical Engineer, at present employed. Have a clientele of good distributors. Box D-680, The Oil and Gas Journal, Tulsa, Oklahoma.

SUPERINTENDENT or Asst. Supt. Mid-West Independent Refinery, 20 years all types refining, technical education, employed. Box D-689, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131. Ph. No. 131, Hobbs, New Mexico.

HIGHLY CAPABLE contact man with good education, personality, and experience desires position with reputable drilling contractor or sales organization. Salary and commission. Well known in Mid-Continent area. Available on due notice. Address Box D-672, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL ENGINEER, 35, Diversified and responsible process design experience on catalytic cracking, distillation, gas recovery units. Over-all processing studies. Cost analysis. Technical writing. NYC preferred. Employed. Box D-695, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION Superintendent, 35 years' experience in 3 southwest states, desires supervision small property East Texas area. Excellent qualifications building up old production. Available January 1, 1951. Box D-690, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED PETROLEUM CHEMIST available, interest in research and development, supervision, and analysis. Will send qualifications. Box D-685, The Oil and Gas Journal, Tulsa, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell. Registered Patent Attorney, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

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DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

WANTED
PRODUCING ROYALTIES
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SELLING 5% over-ride 480 acres, Johnson County, Wyoming. Continental Oil to drill soon. Box D-693, The Oil and Gas Journal, Tulsa, Oklahoma.

MONTANA ROYALTIES

Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225, Great Falls, Montana.

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M. B. RUDMAN
816 Mercantile Bank Bldg. Dallas
Phone R-6159

WANTED

WANTED: SURPLUS Chemicals, Oils, Waxes, Solvents, Wastes and Residues of all kinds. Chemical Service Corporation, 98-06 Beaver St., New York 5, N. Y.

REAL ESTATE

FOR SALE
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River Oaks Business Property. 70-ft. frontage, corner lot on Westheimer with two-story tile stucco house adjoining Avalon Center. Ample parking facilities. Ideal office or commercial location for oil company or allied field. Price $42,500.

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XUM

LEASE AND DRILLING BLOCKS

FOR OIL OVERRIDE or sale: 500 acre block joins lease of new oil strike in Pickett County, Tenn., by Alvin C. York, Pall Mall, Tenn., and Bruce Jones, Pensacola, Fla. 15 to 20 bbl. well, 550 ft. first survey Brook oil. John A. Damron, Albany, Kentucky.

SHALLOW production, Allen County, Kentucky. 11 Pumping Wells—10 bbls. per day. 18 Wells to Recondition. Joseph Thomas, 50 Radnor Circle, Grosse Pointe Farms 30, Michigan.

2200 ACRES Leases adjoining Wintershide Pool, Coffey County, Kansas. Miss. lime 1600 ft. Will make attractive deal. C. N. Phillips, Nerock Hotel, Burlington, Kansas.

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CALENDAR

October

Independent Petroleum Association of America, annual membership meeting, Jefferson Hotel, St. Louis, October 2-3.

American Gas Association, annual convention, Atlantic City, N. J., October 2-6

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, Mid-Continent meeting, Roosevelt Hotel, New Orleans, October 4-6.

Liquefied Petroleum Gas Association, northeastern and southeastern districts joint meeting, Ambassador Hotel, Atlantic City, October 5-6.

American Institute of Chemical Engineers, Oklahoma meeting, University of Tulsa, Tulsa, October 7.

American Association of Oilwell Drilling Contractors, annual meeting, Mayo Hotel, Tulsa, October 9-10

National Association of Corrosion Engineers, south-central regional meeting, Rice Hotel, Houston, October 9-10.

Instrumentation for Process Industries, fifth annual symposium, Texas A. & M. College, College Station, Tex., October 11-13.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, West Coast meeting, Elks Club, Los Angeles, October 12-13.

Western Petroleum Refiners Association, regional meeting, Gladstone Hotel, Casper, Wyo., October 12-13.

West Virginia Geological Survey, conference on secondary recovery of oil in West Virginia, Morgantown, W. Va., October 13-14

Oil Progress Week, October 16-21.

National Safety Congress, Chicago, October 16-20. Petroleum Section, October 17.

Texas Independent Producers and Royalty Owners Association, directors' meeting, San Antonio, October 18.

American Association of Petroleum Geologists, Pacific Section, Ambassador Hotel, Los Angeles, October 19-20.

Society of Economic Paleontologists and Mineralogists, Pacific Coast Section, Ambassador Hotel, Los Angeles, October 19-20.

Society of Exploration Geophysicists, Ambassador Hotel, Los Angeles, October 19-20.

Permian Basin Oil Show, Odessa, Tex., October 19-22.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month. Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month. Jonathan Club.

New York Nomads, dinner meetings, October 2 and November 6, Louis Sherry's; annual Christmas dance, December 9, Hotel Pierre.

Oklahoma A.I.Ch.E. Meets

TULSA.—The Oklahoma meeting of American Institute of Chemical Engineers will be held at the University of Tulsa October 7. A number of papers will be presented on technical data of various processes.

The following topics will be presented during the 1-day meeting:

"Natural Gas Liquids, a Major Source of Motor Fuel," B. R. Carney, Warren Petroleum Corp.; "Texaco Combustion Process—High Compression Without High Octane Fuels," E. M. Barber, C. W. Davis, and W. T. Tierney, The Texas Co.; "History and Recent Developments—Natural Gas Processing," V. E. Middlebrook, consultant; "Platforming," Vladimir Haensel, Universal Oil Products Co.

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No place for Rip Van Winkles

TWENTY years bring changes--changes far greater in our fast-moving world than ever happened in Rip Van Winkle's day.

Americans are awakening to unpalatable facts--that the enterprise system which built our nation and made it strong is being subtly undermined; that advocates of backdoor socialism and communism thrive in our midst; most dangerous of all, that our young people are misinformed on economics.

For example, a recent survey of high school seniors reveals that they estimated that it takes only an $81 investment to provide a job. Actually, as shown by the 1947 census, the 2256 establishments of the iron and steel industry invested $545 per worker that year alone in *new* plant and equipment. Total investment to provide one job runs well above $10,000.

These youth had a similarly distorted picture of profits. They believe shareholders receive 24% of the sales dollar whereas they receive an average of less than 3%.

Misinformed minds are a ready field for imported false philosophies. And it is up to you, a business leader in your community, to take responsibility toward correcting these misunderstandings. The American businessman must not permit himself to be lost in Rip Van Winkle befuddlement.

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Drilling in crooked-hole country?

FIELD-PERFORMANCE RECORDS in crooked-hole areas have proved that, with proper weight and drilling procedure, *Hughes Rock Bits drill straighter holes faster.* Generally, if the bit *should* start off, holding up on the weight will help bring the hole back.

It is especially important when drilling in crooked-hole areas not to run your bit until the teeth become too dull. Dull teeth necessarily require more weight to drill efficiently.

Hughes Rock Bits have set footage records in crooked-hole regions all over the country. It is this record for fast footage—proved in field after field all over the world—that has made Hughes Rock Bits the first choice of the drilling industry.

The selection of the proper type of Hughes bit depends upon the area and formations being drilled. There is an experienced Hughes representative in your area who will gladly recommend the correct type of rock bit for your particular formation.

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